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The largest, and probably the most important, mining enterprise at present under way in Utah is to be found in De La Mar's Mercur Mines, where an extensive ore-body of the character peculiar to the Mercur District is now being worked. This enterprise is of special interest, not only on account of its extent, but because of the patient and intelligent work which has been expended in solving the difficult problem of treating the peculiar ores in large quantities and at a moderate cost. An account of this work is of value to mining men and metallurgists almost everywhere. On another page our Utah correspondent gives, through the courtesy of the officers of the company, a very full illustrated account of the mining methods adopted in the great mine; and this will be supplemented next week by an account of the ore treatment. These articles form a contribution of much interest to current mining literature, and deserve careful reading.

The Sulphide Corporation, an abstract of whose report is given in another column, is having some success and earning something for its shareholders since it gave up its attempts to work with the Ashcroft process. The mine which it purchased at Broken Hill is the basis of its present work, the zinc-lead sulphide ores being concentrated, and the lead concentrates—so called, though they still contain some zinc—are smelted in the company's works at Cockle Creek. The zinc residues are not treated in Australia, but a considerable quantity—partly residues from Ashcroft experiments—have been sold and shipped to Belgium and Germany. The company is doing well at present, but succeeded only because the managers recognized promptly the complete failure of the process which it was first organized to work, and dropped the costly experiment. It has been saved only by this promptness in recognizing facts, and by the fortunate purchase of the Central Mine at Broken Hill, which give it a valuable asset.

The report of the Palmarejo & Mexican Gold-fields, Limited, an abstract of which was published in our columns last week, shows that the opinion expressed in the "Engineering and Mining Journal" seven years ago, in relation to the Palmarejo Mine was substantially correct. The discovery of a small body of ore delayed the end for a time, but the report now says that the Palmarejo property is practically exhausted and little or nothing more can be expected from it. The mine has never returned the large amount which has been spent upon it and sunk in operating it and extending its explorations.

The present company, which is the third or fourth reorganization of the original corporation, some time ago bought the Huruapa Estate, an adjacent property, and now bases its expectations of future profit on that purchase, which covers a considerable area. We hope that in this case the perseverance of the company will be rewarded; though it would now be far better off if its managers had taken good advice and abandoned the Palmarejo some years ago. We would advise a very careful investigation of the value of the new property if the old officials of the company are still in control.

The English coal trade, like our own, has had a very profitable and active year. The demand for use in manufacturing has been so great that colliery operators have had difficulty in filling orders. Recently a special demand has arisen for steam coal, from the number of vessels chartered by the Government to carry troops and stores to South Africa. Prices have gone up, the difference in the quotation of best steam coal in Liverpool, comparing January and the first week in December, is $1.75 a ton. For other grades of coal the increases vary from that figure down to $1 a ton. The miners are participating in the largely increased profits, and will have their wages raised on January 1st, in some districts to the highest point ever paid.

Under these circumstances there is some delay in filling orders. Those for coal for vessels take precedence, as many of them are pressing, and other interests have to wait. This is especially the case with foreign orders, and there is much complaint in European ports about failure to receive coal according to agreements. The usual remedy would be to go somewhere else for coal; but just now there does not seem to be anywhere else to go. Our own coal operators are pretty fully occupied; but they might find an opportunity to sell still more coal.

Mr. J. B. Robinson, the head and chief owner of the Robinson group of mines, which are among the richest and most profitable of the Witwatersrand mines, recently made a speech at the meeting of the Robinson South African Banking Company in London, which has attracted much attention. He made some predictions as to the war, which do not seem to be justified by the course of events just now, but his belief as to the results of the conflict seem to deserve some attention. Mr. Robinson, while not active in politics, has been on better terms with the governing element in the Transvaal than any other prominent Englishman, and an intimate personal friend of President Kruger. He believes that when the war has been fought out to a conclusion, there will be far less difficulty in adjusting matters than is generally ex-

pected, and that the Boers and Outlanders will soon be able to live and work peaceably together. He thinks that this condition will be largely brought about and enforced by the pressure of the native element, and the necessity which the white men in South Africa must always feel of keeping the black men—who are so largely in the majority—in subjection.

Mr. Robinson also predicts an active future for the mining industry and a considerable reduction in working costs if British supremacy should be established. This reduction will considerably extend the area and the number of mines which can profitably be worked. His views are certainly entitled to consideration.

## THE BEACH MINING CLAIMS AT NOME, ALASKA.

A question of much local importance has just been decided by Commissioner Hermann of the General Land Office, regarding placer mining on the beach of the Behring Sea off the coast of Alaska at and near Cape Nome, the new gold-field. The decision affects mining and locations embracing tide lands below the line of ordinary high tide. Numerous applications are pending before the Interior Department as to locations on such lands, which have been demonstrated to contain gold. Individuals or associations of persons, and incorporated mining companies are seeking concessions from the Government, by which they may acquire exclusive mining rights and privileges pertaining to such tide lands.

The commissioner decides that tide lands in the District of Alaska are not public lands subject to disposal to individuals under any of the existing land laws of the United States, and that the department has no statutory authority to make concessions to individuals of any mining rights pertaining to such tide lands.

A citation is made by the commissioner to the case of Shiveley vs. Bowlby, decided by the United States Supreme Court, in which it was held that the United States on acquiring a territory, whether by cession from one of the States, or by treaty with a foreign country, or by discovery and settlement, takes the title and the dominion of lands below high-water mark of tide-waters for the benefit of the whole people and in trust for the future States to be created out of the territory, and it was further held that Congress has not undertaken, by general laws, to dispose of lands below high-water mark of tide-waters in a territory, but unless in case of some international duty or public exigency, has left the administration and disposition of the sovereign rights in such waters and lands to the control of the States, respectively, when admitted into the Union.

This decision leaves the beach miners at Nome and vicinity in the same position they now hold. They can work the claims only so long as they are in actual occupation. So far there has been a general agreement among the miners which seems to have worked very well; especially as the gold-bearing sands are of small depth and it does not take long to work out a claim. It is easy to see, however, that dissensions and serious trouble might arise over the possession of a claim.

The decision will also prevent the holding of any large section of the beach by a company, and will very probably prevent the use of machinery for working on a large scale, since there will be hesitation about spending large sums for machinery when the possession of a large territory is doubtful. It will probably leave the beach mines open to individual prospectors and miners, as now.

Of course an appeal may be taken from the Commissioner's decisions, but is seems to be founded on law, and will probably stand unless Congress should take some special action in the matter.

## THE FINANCIAL SCARE.

The financial flurry which startled Boston last week and has this week upset Wall Street temporarily, seems, as the week closes, to have passed over, and the speculative markets have settled down to a comparative calm. The disturbance has been widely heralded as a "panic," and perhaps it was, as far as Wall Street and State Street are concerned; but outside of those precincts it has had very little effect. There has been no check in general business; manufacturers and miners are actively carrying on their work, and not even a momentary lessening of demand is visible anywhere.

This is not surprising, if we consider the causes of the so-called panic a little. In one sense it was simply a reaction. When prosperity and business activity began to prevail after a long period of depression, it did not take long to bring out a large part of the surplus which had gradually accumulated during a time of economy, at first enforced by hard times, and then continued from habit and caution long after it had ceased to be absolutely necessary. Of course there were abundant opportunities for investment offered by the expanding trade of the country, and as these were quickly taken up, promoters stood ready to offer others, many of which would not stand the test of a time of business caution, but were readily taken up when activity existed everywhere and a boom had fairly set in. Everyone was ready to buy, believing—as people always do in such times—that prosperity would last forever; or at any rate, that they could sell out before the reaction came. That the reaction would come, and that it would involve disaster for careless buyers, we have often pointed out, though such warnings are generally unheeded in boom times.

The investment of enormous sums in new companies which has been going on so actively during the past year is sure to be felt after a time. The capital thus absorbed ceases for the time to be available. When to this was added the sudden and unexpectedly large demand for funds abroad, it is no wonder that money became scarce—in the speculator's sense of the term—and those who had been operating on borrowed capital found themselves at the end of their resources. In such a condition of affairs it does not take much to upset the stock market. In this case the starting point was found in Boston in the difficulties of a bank which had been identified with a group of mining speculators; and the trouble quickly spread from Boston to New York.

In all this affair we find no cause for serious apprehension. As we remarked above, general trade is not seriously affected, and with all the talk of "tight money," legitimate business finds no difficulty in securing what it needs, though of course higher rates of interest are the rule than in a slack time. All legitimate mining and metallurgical enterprises are prospering, and producers of the industrial metals are reaping the benefit of the high prices due to active demand. Those who have confined their investments to established and well known mines and industries, or to new ones which were properly investigated and intelligently undertaken, have no cause to complain. There never has been a time when the mining industry was more prosperous or in better condition than at the present day. Our production of iron, copper, lead and zinc, for instance, has been larger this year than ever before and has commanded higher prices than for years past. The output of gold and silver has been very large. The coal mines no longer compete with each other, their only difficulty being to produce enough to satisfy the demand; and it is so through almost the whole list of our mineral and metal production.

The people who suffer now are not those who own mining properties proved or in actual operation. It is those who bought without thought or knowledge; who eagerly paid for doubtful claims and prospects the price of mines; who were carried away by the boom, who are losing now. The owner of stocks which are earning substantial returns is very little affected by the temporary fall which comes in times like the present, when good stocks are carried down with poor ones in the general scare. They are sure to recover their level when the scare is over, and their dividends are not affected.

The Boston panic, which is of more direct interest to mining investors than the New York flurry, is traceable directly to the overloading of the market with stocks of doubtful value. Some of the properties which these stocks represent may prove to be worth something hereafter, but time and money are required to prove them, and they are temporarily a load very difficult to carry. Even of the better ones, many are capitalized far beyond their real value. Others will never yield any substantial return, and the money put into them is or will be a total loss.

An element which certainly added to the trouble has been the lack of definite knowledge. The holder of stock in a company which makes full and careful reports is not likely to be carried away in a temporary scare; he knows just where he stands and what his stock is really worth, and he will not part with it for less, nor will he be seriously disturbed by a temporary fall in quotations. On the other hand, if the knowledge he ought to have is carefully kept from him, he and his company are both sufferers. The stock may be sold at a sacrifice and the company loses credit. Did space permit we could point out several striking instances of this during the late crisis. "Blind pool" tactics may answer in a boom period for a time, but they are sure to bring trouble in the end; and with each recurrence of disaster investors become more and more impressed with this fact.

## NEW PUBLICATIONS.

"California Mines and Minerals." Published by the California Miners' Association, under the direction of Edward H. Benjamin, Secretary, for the California Meeting of the American Institute of Mining Engineers. San Francisco, 1899. Pages, 450; with maps and illustrations.

This handsome volume was issued by the California State Miners' Association as a memorial of the California meeting of the American Institute of Mining Engineers, the intention being at the same time to give the visitors a general idea of the resources of the State and of the present condition of mining and metallurgy within its borders. The State Association certainly did its work well and much credit is due to its liberality; while to Secretary Edward H. Benjamin, under whose direction the book was prepared, praise should be given for the selection and editing of the matter which it contains.

Of the 450 pages, 262 are filled with papers on the general topics of mining in California and its accompanying developments; the rest

being composed of condensed monographs on the different mining countries and their special developments. The list is a long and notable one, the authors being men well known in mining circles. Thus the general papers include: "Mineral Industry of California," by Charles G. Yale; "The Mother Lode of California," by Ross E. Browne; "Electric Power on the Pacific Coast," by A. M. Hunt and Wynn Meredith; "Dredging for Gold," by R. H. Postlethwaite; "Deep Mining at the Utica," by J. H. Collier, Jr.; "Genesis of Petroleum and Asphaltum in California," by A. S. Cooper; "Fineness of California Gold," by Frank A. Leach; "Petroleum in California," by W. L. Watts; "Copper Resources of California," by M. M. O'Shaughnessy; "Use of Machine Drills in Stoping," by B. L. Thane; "A New Form of Scorifier," by E. H. Simonds; "The College of Mining, University of California," by S. B. Christy; "Mining Debris Legislation," by Charles G. Yale.

The county monographs include: Nevada County; Butte County, by A. Ekman; Placer County, by Ivan H. Parker; El Dorado County; Amador County, by W. H. Storms; Calaveras County, by H. W. H. Penniman; Tuolumne County; Mariposa County, by W. H. Storms; Northern California; Plumas and Sierra Counties; Yuba County; Alameda County; Fresno and Madera Counties; Southern California. The resources of each county and section are well and carefully summed up.

Other special monographs given are on the "California Miners' Association," by J. H. Neff, its president; "The State Mining Bureau;" "California as a Field for Mining Capital," by W. C. Ralston; "Quicksilver in California." The volume closes with four short descriptive papers: "The Evans Hydraulic Gravel Elevator," by T. J. Barbour; "A Brief History of Concentration," by George Johnston; "A Massive Bridge Pier of Unique Construction;" "Heat Insulation," by William Borrowe.

Space does not permit any detailed criticism of the several papers; but it may be said that they were written by men thoroughly familiar with the subjects on which they were treating, and anxious to present them in their best light. The choice of writers was generally good; indeed it would be hard to make a better list. It constitutes the most nearly complete presentation of the varied and extensive mineral resources of the State which has been collected in a single volume.

The book contains a number of county maps; and is further illustrated by drawings and diagrams, besides a number of excellent half-tone reproductions of photographs of mines, machinery and mining localities. The mechanical execution is very good, the printing, engraving and binding being all creditable to the California publishers, who did the work.

The members of the Institute who received copies of this volume fully appreciated the handsome gift; and will, we are sure, each retain his book as a valuable addition to his library, as well as an enduring memorial of the California meeting.

## BOOKS RECEIVED.

In sending books for notice, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review on another page of the Journal.

"Special Consular Reports. Volume XVI. Tariffs of Foreign Countries." Washington; Government Printing Office. Pages, 1,304.

"Report of the Commissioner of Education for the year 1897-98. Volume I." Washington; Government Printing Office. Pages, 1,280.

"Special Consular Reports. Volume XVII. Foreign Trade in Coal Tar and By-products." Washington; Government Printing Office. Pages, 266.

"Annual Report of the Commissioner of Internal Revenue for the Year Ending June 30th, 1899." Washington; Government Printing Office. Pages, 204.

"Transactions of the Institution of Mining and Metallurgy, London. Eighth Session, Volume VII." Edited by Arthur C. Claudet. London; published by the Institution. Pages, 348; illustrated.

"Society for the Promotion of Engineering Education. Proceedings of Seventh Annual Meeting, held in Columbus, Ohio, August, 1899." Edited by Thomas C. Mendenhall, Ira O. Baker, Albert Kingsbury, Edgar Marburg, Committee. Published by the Society.

## CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials will only be published when so requested.

Letters should be addressed to the MANAGING EDITOR.

We do not hold ourselves responsible for the opinions expressed by correspondents.

### Mining Experts in British Columbia.

Sir: A great many so-called experts are reporting upon properties in Southern British Columbia. Some of them do not possess even the rudiments of a common school education, and seem to think all they have to do is to string together as many geological terms as the report will contain, allowing the necessary margin for superlatives, and calculations of tons of ore "in sight." One of their pet practices is to estimate all copper in the ore at 17c. a pound; or else to vary the monotony by calculating each unit at $3; notwithstanding that no British Columbia smelter probably pays more than $2.30 a unit.

On the other hand, we have half a dozen men whose reports are masterpieces of careful, intelligent work, and fully worth the large sums they charge for them.

I presume, however, that the same condition exists in almost every active district, and that incompetent men will put themselves forward. The misfortune is that promoters prefer to use the incompetents, and that in too many cases their names carry about as much weight with the innocent public as those of the real experts. Those who are honestly interested in the country ought to do all they can to expose the charlatans.

A. C.

Victoria, B. C., Dec. 10, 1899.

## THE PURIFICATION OF ACETYLENE.

Attention has repeatedly been called by writers on acetylene and acetylene lighting to the necessity for purifying the gas generated by the action of water upon commercial calcium carbide. The most important impurities in the gas so obtained are: 1. Ammonia. 2. Sulphuretted hydrogen. 3. Phosphoretted hydrogen.

The two former are very soluble in water, and are so avoided in those generators in which carbide is allowed to fall into excess of water; and even if not completely removed in this way, their removal is a very easy matter by means of the well-known methods used in the purification of coal gas. The removal of phosphoretted hydrogen, however, is not such a simple matter, and it is, unfortunately, a much more objectionable constituent than either of the other impurities, as it imparts a very offensive odor to the gas, and when the latter is burnt phosphoric oxide is produced from the impurity, which has a most destructive action, and is, in addition, extremely irritating when inhaled.

According to an article on this subject in the "Engineer" (November 3d, 1899) three methods are in common use for the removal of phosphine from acetylene, depending upon the possibility of oxidizing the phosphorus compound without destroying the acetylene. All three methods seem to effect the removal of phosphine equally well, but one of them, purification by means of chloride of lime, seems destined, on account of its cheapness, to supersede the others. When chloride of lime is used there is introduced into the acetylene a small quantity of carbon monoxide and some compounds of chlorine, but both of these impurities are present in the final product in small quantities only, and are comparatively harmless. The earliest suggestion for the use of bleaching power to purify acetylene is to be found in a patent taken out in 1896, but the method has really been worked out by Messrs. Lunge and Cedercreutz.

Considerable difference of opinion still exists as to the efficiency of bleaching powder purifiers, one English firm of manufacturers stating that they employ this method regularly and successfully, while in the case of an installation fitted in Hungary recently it was noticed that the gas, in burning, gave rise to a very strong and unpleasant chlorous odor, derived, it is supposed, from the purifying material.

The whole matter seems to depend on attention to two details in the use of the bleaching powder, that the gas from the generator must not be very moist when it enters the purifier, and it must be free from ammonia. Both these conditions are fulfilled if the gas be first passed through a vessel containing a little weak sulphuric acid. The chlorine compounds introduced by the passage over bleaching powder may be removed by sending the gas over a layer of slaked lime.

It has been the custom of some firms to dilute the bleaching powder with sawdust in order to increase the absorbing surface, and it is probably this admixture which has led to the sudden heating of the purifier and consequent inflammation of the gas in some cases; it is, therefore, best to dilute the chloride of lime with an inert substance, such as sand or kieselguhr. When these precautions are observed there is no danger whatever attending the use of a bleaching powder purifier, and such an apparatus can be safely left in the care of a workman.

## POTASSIUM MINING NEAR HANNOVER, GERMANY.*

The geological features of the country around Hannover are of rather complicated nature, owing to the severe dislocations which the strata has undergone. However, a general idea may be found from the following:

To the north, south and east of Hannover the alluvial sands stretch far and wide, but to the west there are occurrences of the Chalk, Jura and Trias formations. The chalk formations consist chiefly of the lower Senon and the Jura of the lower brown Jura and Lias. Of more importance is the Trias formation—the lower Trias or New Red Sandstone—which builds the hanging-wall to the salt formation. The New Red Sandstone occurs on the Benther Mountain, the upheaval of which is said to have occurred about the middle of the Dogger period.

In the neighborhood of this mountain many deep borings have been put down to locate the potassium salts, and with more or less success. But a peculiar thing about the potassium finds is that they greatly varied one from another, not only in depth but also in composition; also it seemed as if the richer the salts the smaller the layers were; in fact, as Professor Kloos said, the potassium salts of the Hannover District occur in nests or lenses and not in regular layers, as we have in the celebrated formation of the Stassfurt District, but the potassium salts of the Hannover District are, as a rule, richer than those of Stassfurt, and on this account may possibly be successfully mined.

Another geological difference between the Districts of Stassfurt and Hannover is concerning the so-called "younger" and "elder" rock salt. In the former district the potassium salts are found between two layers of rock salt. The upper layer is called the "younger" and the lower layers the "elder" rock salt. These two layers vary in composition one from another. The younger rock salt contains a percentage of potassium, whereas in the elder it is not so marked; also the elder is known by its so-called year's rings. These are layers of anhydrite at regular intervals between the rock salt. In Hannover District up to now we have, so far as the writer knows, not yet met with the elder rock salt, and on that account one might think that if the borings were sunk deep enough they would come in contact with more potassium salts and the elder rock salt, but this would likely be too deep to insure a profitable mining.

*Correspondence of the London "Mining Journal."

## METAL PRODUCTION OF ONTARIO.

From Our Special Correspondent.

The product of the metalliferous mines and works of the Province of Ontario for the nine months ending September 30th, 1899, was as follows:

| | Quantity. | Value. |
|---|---|---|
| Silver, ounces | 98,000 | $58,800 |
| Gold, ounces | 20,210 | 318,212 |
| Nickel, pounds | 4,608,000 | 536,633 |
| Copper, pounds | 4,642,000 | |
| Pig iron, net tons | 48,216 | 693,455 |

The nickel and copper given above are contained in the matte produced in the mines of the Canadian Copper Company, near Sudbury, which is exported to the United States for refining purposes. The yield of silver exceeds that for the year 1898 by 11,400 oz. in quantity and $6,840 in value. The gold output is greater than that for the whole of 1898 by 3,949 oz. in weight, and $43,134 in value.

The quantity of pig iron produced in the nine months of 1899 was 37 tons less than for the whole of 1898, while the value, owing to the rise in price, was $162,666. Full returns for the 12 months are expected to show large increases as compared with last year.

The clean-up at the Mikado Gold Mine (Lake of the Woods) on November 29th for 27 days, resulted as follows: Crushed, 848 tons (of 2,240 lbs.), yielding 658 oz. of gold, and from cyaniding, 512 tons (of 2,240 lbs.), 214 oz. of bullion; total value recovered, $11,590.

SALT IN ONTARIO.—The Ontario Bureau of Mines has commissioned Prof. Courtney De Kalb, of the Kingston School of Mining, acting Inspector of Mines for Ontario, to prepare an exhaustive report on the salt industry in Ontario. The report will be issued shortly and gives a detailed account of the extent of the salt beds, present output, purity of brine and the various grades of commercial salt put on the market, methods of working and refining, with suggested measures for the further extension of the uses of the raw material in the manufacture of soda, soda ash and salts, soaps, etc., for home consumption.

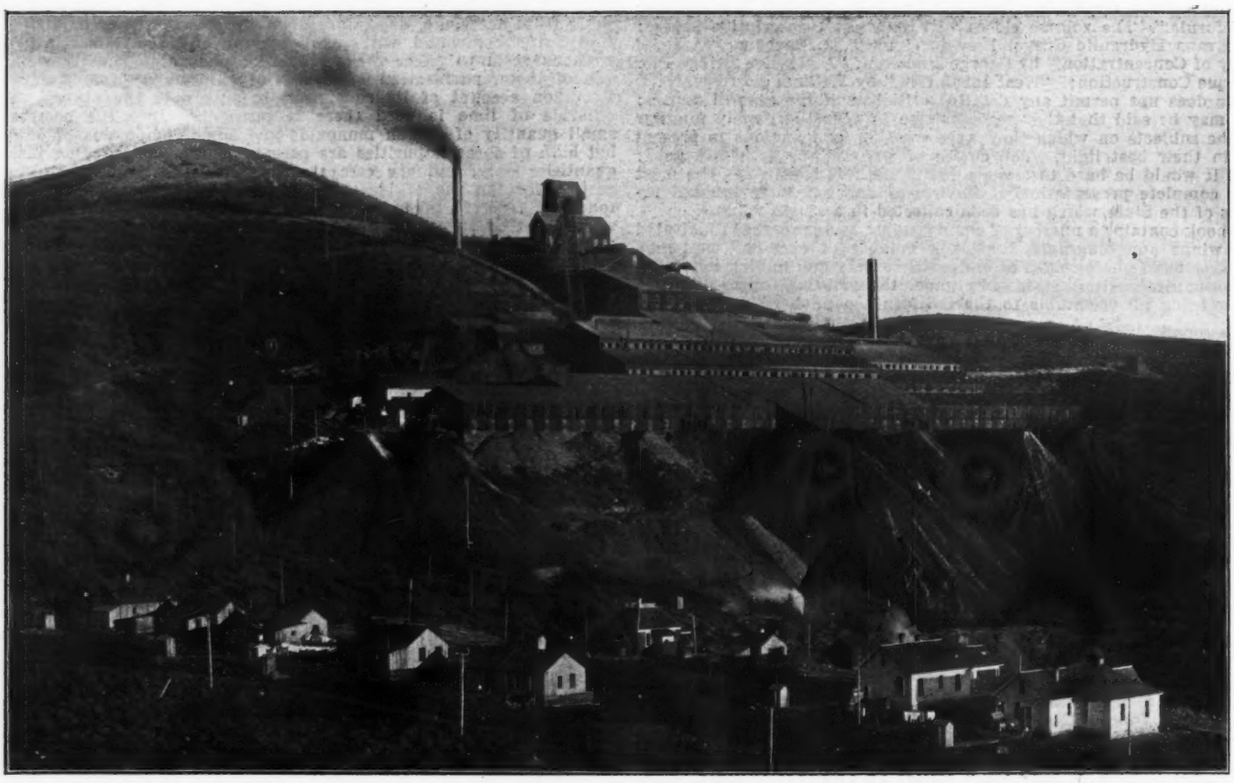
RAILROADS IN JAPAN.—The official reports show that at the close of the last fiscal year, June 30th, 1899, there were in Japan 3,420 miles of railroad in operation, an increase of 472 miles during the year. Of these lines 768 miles belong to the State and 2,652 miles to private companies. The total mileage run by locomotive engines during the year under review was 24,917,429 miles; by trains, 22,977,400 miles; and by passenger and freight cars, 310,667,984 miles; showing, respectively, an increase of 21, 22 and 20 per cent. as compared with the preceding period. The quantity of fuel consumed was 439,791 tons of coal and 14,339 koku of liquid fuel. The traffic returns for the year show that the total number of passengers carried on the State and private lines was 99,061,889, while the freight transported amounted to 9,916,126 tons, besides luggage and parcels which aggregated 36,705 tons. The aggregate receipts amounted to 30,832,084 yen ($15,354,378). Compared with the preceding year there was an increase of 16 per cent. in passengers, 14 per cent. in freight and 18 per cent. in luggage and parcels carried.

## DE LA MAR'S MERCUR MINES, UTAH.—I. THE MINES.

Written for the Engineering and Mining Journal by H. L. J. Warren.

In the United States, gold was first won from its ore by cyaniding at Mercur, in the Camp Floyd District, Utah, about 8 years ago, and to-day that method of extraction is the anchor of hope for the region. Were it not for this process these mines would be unknown. Each notable district has one property of special worth. De La Mar's Mercur Mines are the beacon light of Camp Floyd; of which much is known in a vague sort of fashion—the huge cyaniding plant, the base character of the ore, the large tonnage treated after more than four years devoted to experimental metallurgic tests and equipment—and that is about the sum total.

Captain J. R. De La Mar made his first purchase early in 1895 and immediately inaugurated systematic exploration on a comprehensive plan and at the same time the solution of the complex metallurgic puzzle was begun. The original Golden Gate group comprised 143 acres and other tracts have since been added, till the area in one compact body now owned by Captain De La Mar is over 800 acres and each new tract was purchased as found desirable, or valuable, from the unfoldings of the exploration started in the Golden Gate. During the same period the crude miniature experimental mill has grown to, or been



Mill and Surface Works, De La Mar's Mercur Mines, Utah.

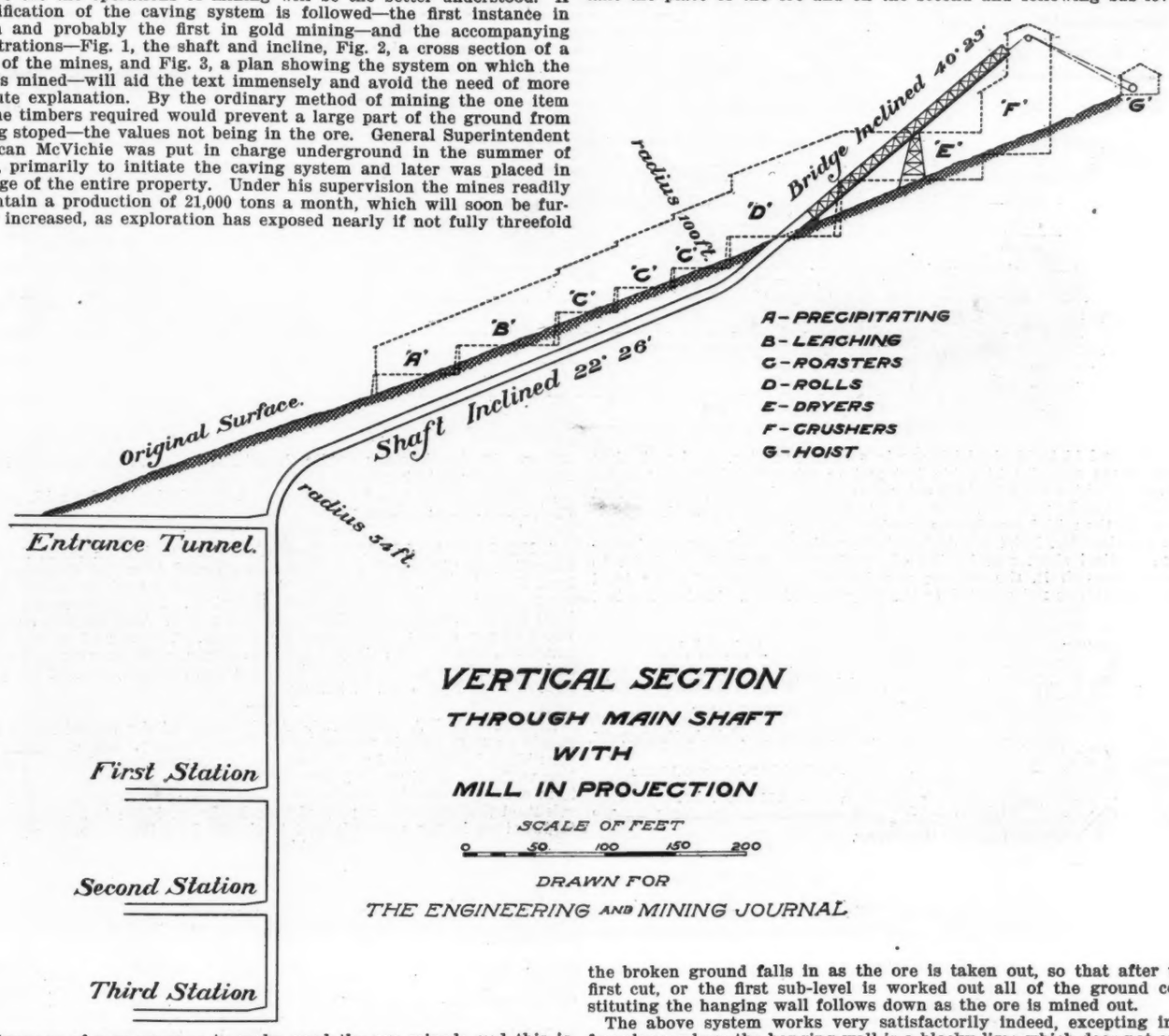
replaced by, a huge steel structure—Utah's largest ore treatment plant. An epitome of the story of these five years with the successful culmination of the complete equipment of the mines and the mill, on the opening of the new century, forms a most interesting chapter in western mining.

Mercur town is near the vertical axis of an uplift, caused probably by the intrusion of an eruptive mass immediately beneath the strata and from this axis the strata are inclined in all directions. As is frequent in such uplifts, the summit of the arch has been deeply eroded, forming Lewiston Canyon, where the upturned strata are exposed to view. The Mercur Mine is on a steep hillside south of Mercur town, which is built along the winding course of Lewiston Canyon and the Golden Gate tract joins the Mercur Mine on the northeast, lying east of the town, while the other adjoining tracts composing the De La Mar Mines, are to the east, north and northwest. The predominant rocks of the region are limestones, especially toward the lower portion exposed; above alternating with shaly beds containing thin layers of limestones, while toward the summit shaly beds predominate. Some of the limestones contain considerable cherty or quartz material. Outcropping around Lewiston Canyon are two ore-bearing zones, from 100 to 200 ft. apart, substantially conformable with the strata and therefore dipping away from the center of upheaval. In the lower zone the silver of the Lewiston era—the early 70's—was found, the ore occurring in the cherty material. This silver ledge, in the Brickyard tract of the De La Mar Mines, carries good gold values, though this is contrary to the belief of the wise pioneer. The upper metalliferous horizon is the one to which the district owes its present impotrance. Here the auriferous ore occurs as an impregnation of limestone and shale, in the main along lines of bedding. The dip of the strata and enclosing veins varies from 8° to 15°. In the upper zone are 2 or 3 separate ledges, though they unite in places and form thick ore bodies. It would be expected from the rock formation that faults and displacements abound, and this is

true, contributing an additional geologic interest to the exploration of the ore bodies. Errors in properly reading these faults, particularly in Golden Gate's early development, caused extensive ore bodies to be passed over, or under, which to-day handsomely augment the reserves.

There are two distinct varieties of ore, oxidized and base, though in operating the mill a third classification is made, known as "mixed." The gangue is made up of a mixture of the rock of the enveloping strata, imperfect quartzite, limestone and shale, frequently stained by clayey, or talcose material. For the most part the ore has a yellowish or brownish cast, though each separate kind of rock retains its distinctive characteristics. There is but little iron, and the mineral as mined carries 30 to 60 per cent. silica. The base ores carry 1 to 5½ per cent arsenical sulphides—orpiment and realgar. Cinnabar occurs in occasional bunches, thin layers and fine stringers. Values swing between wide limits from $2 to $60 or over, the base carrying the higher gold content; ordinarily the ore rules between $3 and $12.

With this outline of the rock formation and the eccentric characters of the ore the operations of mining will be the better understood. A modification of the caving system is followed—the first instance in Utah and probably the first in gold mining—and the accompanying illustrations—Fig. 1, the shaft and incline, Fig. 2, a cross section of a part of the mines, and Fig. 3, a plan showing the system on which the ore is mined—will aid the text immensely and avoid the need of more minute explanation. By the ordinary method of mining the one item of the timbers required would prevent a large part of the ground from being stoped—the values not being in the ore. General Superintendent Duncan McVichie was put in charge underground in the summer of 1897, primarily to initiate the caving system and later was placed in charge of the entire property. Under his supervision the mines readily maintain a production of 21,000 tons a month, which will soon be further increased, as exploration has exposed nearly if not fully threefold the tonnage of new reserves to make good the ore mined; and this is being continued month by month. Mr. McVichie is to-day the authority on the Mercur Region, not only as to mining but as to the trend and whereabouts of ore zones.




The main working artery is part shaft and part incline—3-compartment, 14 by 5½ ft.—vertical for 300 ft. and then turning an angle of 29°, passing under the leaching and roasting departments of the mill, where it makes an angle of 45° and comes to the surface; it then passes over a steel trestle to the top of the shaft house, where the crushers are placed. Two of these compartments are equipped with 3-ton skips running in balance and operated by two 6 ft. Webster, Camp & Lane drums driven by 150 H.P. motors. The third compartment is equipped with a cage run on wheels, much the same as a skip, and operated by a 4-ft. drum built by the Webster, Camp & Lane Company of Akron, Ohio, and driven by a 75 H.P. motor. The cage is used for the purpose of getting timber and supplies into the mine, and also for taking the men up and down to the Main and Viking levels.

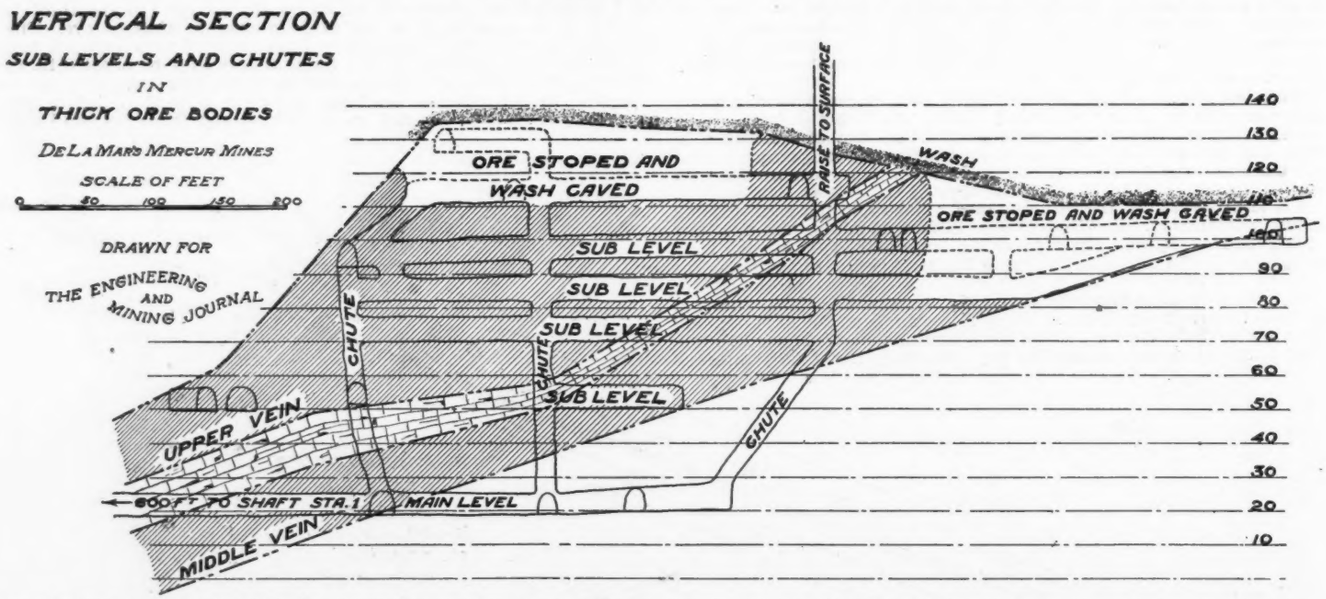
At the Main level the shaft is 200 ft. in the hanging wall and encounters the upper lode at the Viking level. A cross-cut is driven from the Main level southwest 600 ft., encountering the upper lode at 200 ft. from the main shaft, the middle lode at 500 ft. and the lower lode at 600 ft. At 200 ft. from the shaft there is a drift on the strike of the upper lode and at 500 ft. from the shaft a drift on the strike of the middle lode. Rises are put up from this cross-cut and from the drifts to the top of the upper lode. These raises are connected, where it is practical to connect them, by drifts and the ore body cut into blocks as near 50 ft. square as it is practical to get them. When the ore is cut into blocks stoping is begun at the farthest point from the raises, or at the outside of the ore body, and the ore drawn out toward the raise, cutting it into small blocks and afterward drawing the pillars and the ore out of the back of the drift and the back of the pillars. While this is in operation another sub-level is being cut, 14 ft. below the one being stoped. This sub-level is cut into blocks the same as the upper one while the upper one is being stoped. As soon as the upper sub-level is stoped out, stoping is begun on the second and the third is started, to be opened up in the same manner as those above. The drifts are 4 ft. wide by 6½ ft. high and are timbered with drift sets and lagged closely. The timbers used for drift sets average about 6 in. in diameter, the lagging averaging about 3½ in. in diameter.

As the ore is stoped out the hanging wall is allowed to fall in and take the place of the ore and on the second and following sub-levels the broken ground falls in as the ore is taken out, so that after the first cut, or the first sub-level is worked out all of the ground constituting the hanging wall follows down as the ore is mined out.

The above system works very satisfactorily indeed, excepting in a few places where the hanging wall is a blocky lime which does not cave very readily, and to overcome this difficulty the first sub-level is taken out on stulls to support the hanging. When sufficient area is mined out, so that these stulls show distress, they are blasted and the hanging wall allowed to cave in. After this the balance of the levels below are worked out on the regular caving system.

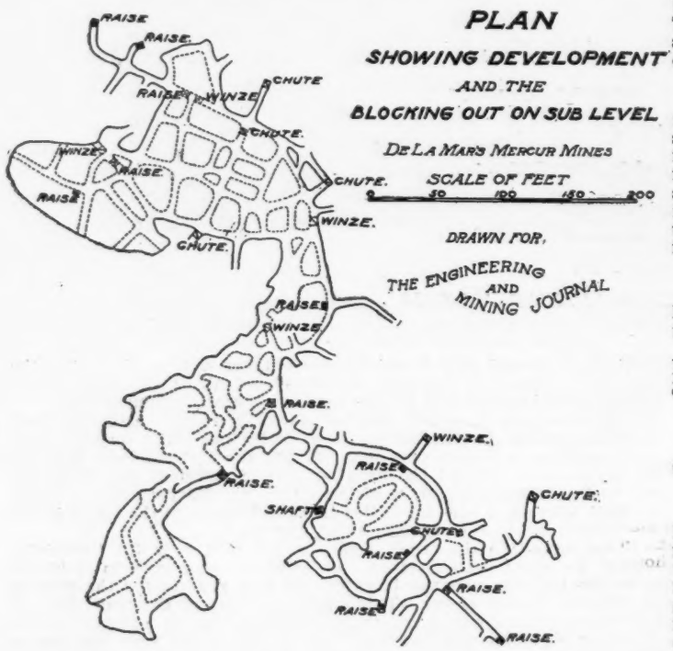
To accommodate the requirements of the mill over 700 tons daily have to be mined, which necessitates breaking ore from 4 to 10 blocks at a time and the constant blocking out new squares for the stoping of different classes of ore. This affords an idea of the magnitude of the territory being mined and the ever urgent need of keeping up surveys and incessant map making. This is one of the most interesting phases of this most interesting method of economic ore handling. The check on the work is so close and accurate that accidents, through the caving system proper, are no more frequent than in ordinary mining. It is non-extra-hazardous for miners accustomed to it and the ground being securely protected and held behind them, men work taking down the last remnant of ore in the face, or in the midst of a caving block within a few feet of snapping timbers and gently settling roof. Across the gulch above the town, between the Mercur Mine and the Golden Gate, a mammoth cave has extended to daylight, which has altered the topography or scenery quite as much as the huge tailing dump near by, below the mill, and the relation of one to the other is immediately suggestive.

Miners work a shift of 8 hours, or 8 hours' actual work, and there are two shifts a day, which affords several hours a day for extending tracks, repairs and incidental work while ore is not being broken or hoisted. Ore hauling under ground to the shaft is by mules. It is common to speak of the number of miles of workings in a mine and the underground map indicates that De La Mar's Mercur Mines will soon be a record smasher, if it has not already arrived at that distinction. The shaft and main workings are lighted by electricity. Power is electric; more particular mention will be made in describing the mill and its equipment. Two 12-drill Nordberg power compressors are




installed and 15 to 20 air drills are in constant service. Before broken a ton of ore occupies 14 cubic feet and to mine 21,000 tons a month means the taking out of 294,000 cubic feet of rock, besides the waste that is required to be removed. From 2½ to 3½ tons of ore per day are delivered to the mill for each man employed in the mine.

At the time Mr. McVichie designed the main working artery, of combined vertical shaft and incline of varying angles with the hoist to operate through it, the scheme was looked on askance by the local mining world, as not adapted to the duty it performs. He has the last




laugh, for it works admirably. From the day it was put into commission no annoyance in any way has been occasioned. At times 1,100 tons have passed over its rails in 11 hours, and it is difficult to conceive how under the conditions presented any improvement can be made for the special duty required.

There are many things relative to these mines that cannot here be given, which would be of interest to the readers of the "Engineering and Mining Journal." This review is the most accurate and complete that has appeared in type, presenting conditions up to the opening of 1900. It fairly covers the salient features. From the time of Captain De La Mar's first purchase at Mercur, about five years ago, till he began to derive a revenue from the property, the total outlays were in excess of $2,000,000. To-day the ore blocked out assures a profit of fully $5,000,000, without speculating on what future exploration will uncover.

A sensational purchase of gold-bearing ground was made in the fall of 1897, consisting of less than seven acres of the Resolute claim, owned by the Mercur Gold Mining and Milling Company, which extended like a peninsula into De La Mar territory. For this tract $237,500 was paid. The worth of this small area was well tested beforehand and it has proven one of the best of Captain De La Mar's investments. At the time the public thought it an extravagant expenditure for low grade gold bearing ground.

A second article will be devoted to a description of the mill, power, equipment and metallurgy.

A NEW CERIUM MINERAL.—Before the Russian Chemical Society, according to "Science," a new cerium mineral from the Caucasus has been described by G. Tschernik, which from the analysis seems to be essentially a titanate and zirconate of cerium. It contains a gas which is 90 per cent. a mixture of nitrogen and argon. The mineral contains but 0.03 per cent uranium and no helium. The ash of a coal from Tkwibuli, which was chiefly calcium sulphate, with alumina and silica, and about 10 per cent. of ceria, lanthana and didymia, showed the presence of over 1 per cent. of helium.

AMMONIA AS A SOLVENT.—An instance of the use of liquid ammonia as a solvent is shown by C. Hugot, says "Science," where the selenides of sodium and potassium are thus formed. A mixture of selenium with the alkali metal is treated with liquid ammonia. If the metal is in excess the insoluble selenide $Na_2Se$ or $K_2Se$ is formed, while if the selenium predominates a polyselenide $Na_2Se_4$ or $K_2Se_4$ is formed, which is dissolved in the ammonia and is obtained on its evaporation. Contrary to the observation of Franklin and Krauss, Hugot finds that selenium itself is insoluble in liquid ammonia.

PETROLEUM IMPORTS INTO GREAT BRITAIN.—Imports of petroleum into Great Britain for the 11 months ending November 30th were, in gallons:

| | 1898. | 1899. | | Charges. |
|---|---|---|---|---|
| United States | 155,046,701 | 150,006,435 | Dec. | 5,040,266 |
| Russia | 39,601,021 | 65,091,066 | Inc. | 25,490,045 |
| Other countries | 1,461,951 | 3,937,728 | Inc. | 2,475,777 |
| Totals | 196,109,673 | 219,035,229 | Inc. | 22,925,556 |

The total increase this year was 11.7 per cent. American oil was 68.5 per cent. of the total this year, against 79.1 per cent. in 1898.

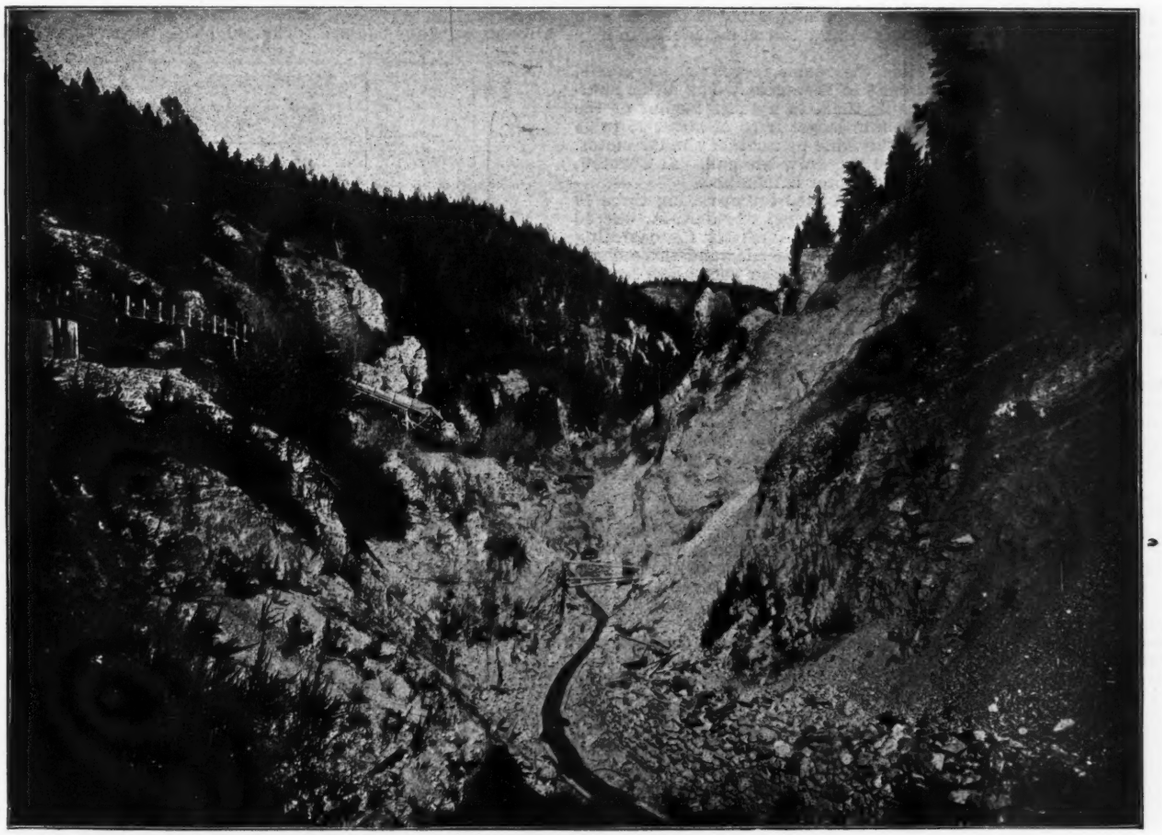
BELGIAN ARTIFICIAL STONE.—United States Consul Atwell of Roubaix, France, on October 17th, 1899, writes: "An artificial stone from Belgium has recently been introduced into the French market, which is said to have four times the force of resistance of French free stone and which has nearly all of the properties of Cobestang granite. It has been tried in the Malines Arsenal and is found to be insensible to the action of cold, absorbs only 6 to 7 per cent. of water, even after a long dry spell, and can not be crushed under a pressure of 40 kgs. to the square centimeter. This artificial stone is manufactured at Uccles, near Brussels, in the following manner: 80 parts of extremely clean and dry coarse sand are mixed with 20 parts of hydraulic lime reduced to a fine, dry dust; this mixture is put into an iron box, which is plunged into a boiler of water, and this is hermetically closed. During 72 hours the cooking goes on under a pressure of 6 atmospheres, the temperature being maintained at 165°. At the end of this time the iron box contains a perfect homogeneous mass of stone, which rapidly hardens upon exposure to the air. The most varied colors are given to this stone, and its manufacture costs only 2c. per cubic foot."

## THE BEAR GULCH PLACERS, MONTANA.

Written for the Engineering and Mining Journal by Fred D. Smith

Bear Gulch, in Missoula County, Montana, is a ravine, 12 miles long, which extends from near Garnet to Bearmouth, where the Bear Creek empties into the Hellgate River. About 8 miles from Bearmouth the gulch divides into Deep Gulch on the northeast and Bear on the northwest. These gulches were noted in early days for the large amount of placer gold that was taken out from the gravel as well as for the extreme richness of the ground. The mining began as early as in 1866 and the decline did not begin until in the early seventies. The gulch was very narrow throughout its entire length, but the gravel in many places was very deep. Much of the mining was done by sinking shafts and then drifting on the bed rock. It is reliably stated that one of these shafts, of ordinary size, uncovered a pocket of nuggets on the bedrock which, within the limits of the shaft's linear dimensions, contained over $1,600 in gold.

The gulch was worked in this way and by sluicing from its mouth to its source, and even up the side of the mountain which forms the divide between this gulch and the territory drained by the Blackfoot River. The town of Garnet is built on the ravine washed out by the miners in this placer work on the top of the mountain referred to. The bed of the gulch is filled with tailings and residues of old workings, many of which are sufficiently valuable to pay for operation. The bed of the gulch was in some places lowered a great deal. In the cut the foreground on the right shows the bank nearly 100 ft. high that was made by the mining. The amount of gold taken out during the period of its great productiveness is variously estimated from $25,000,000 to $40,000,000. The lower value is probably none too high.



BEAR GULCH PLACER, MONTANA.

Some work was done during the interval between the boom days and the present time. About 10 years ago a company known as the Bear Gulch Placer Mining Company, composed of two well-known mining men, Messrs. Williams and Tontue, of Butte, bought out all of the claims in the gulch up to Deep Gulch, as well as some in this gulch and some as far up as in the town of Garnet. This company also owns some of the ground in Deep Gulch. The plan of work followed by this company was to construct a long flume in a permanent manner, by means of which the many claims in the gulch can be entirely worked out. All old tailing dumps, drifted ground, etc., were to be sluiced off and the whole gulch cleaned up. A tunnel 400 ft. long was made, through which the flume could pass in a straight line. Owing to the narrow width of the gulch, side flumes had to be constructed to carry off the surplus flood water in the spring and thus save the flume from washouts. The cut shows these points of interest already suggested.

The flume now, after 8 years' work, is about 1¼ miles long, which represents nearly the amount of ground cleaned up. The company has the water rights of the whole stream and is able to get about 160 ft. of pressure for piping. Another flume has been put in on Deep Gulch, near the mouth, but the workings are not so extensive and are often leased to Chinese miners. Whether the placers are paying very large returns is a question unsettled, although it is to be noted that the company are continually working.

The placers which are the richest at the present day are those in virgin ground near the source of Deep Gulch, at a point known as Top-of-Deep. Some very rich ground is found here, though it is so high that it is very difficult to get a good constant supply of water for washing. There is ground there that is believed to be paying $20 per day per man by simply ground sluicing and shoveling.

## ELECTRICITY IN COAL MINING.*

By John Price Jackson and Frank F. Thompson.

The statements in this short paper on the use of electricity in mines refer especially to the mining of soft coal. Of the essential elements in operating such mines, two of the most important are: First, apparatus to obtain efficiently the rapid handling of the coal; and second, to do this with the least possible number of openings. These conditions have evidently been large factors in causing the application of electricity to such operations. The application of power to mines, which we wish to consider, are principally for lighting, haulage, cutting or drilling, pumping and driving fans.

Electric Haulage and Compressed Air Power.—The Berwind-White Company's mines at Windber, Pa., furnish an excellent example of this system, and so far as known it has given complete satisfaction. This plant, which has now six mines in operation with an output capacity of 5,000 tons per day, is eventually to be increased to ten mines with 10,000 tons capacity. The haulage in the mines is done by electricity, while the drills, interior pumps, and fans are driven by compressed air. The use of compressed air has many obvious advantages. It is found that the machinery, working under the extremely severe conditions to be found in a mine, performs its duty well. It requires little attention and is thoroughly reliable. On the other hand, pipe lines in extended mines are expensive to lay and keep in repair. The pipes soon deteriorate and when the lines are removed from old workings it is usually found that much if not all the pipe is in too bad shape for further use.

Electric haulage and power, for convenience in discussion, may be divided into two sub-systems, as follows:

1. Direct currents for haulage and other power.
2. Direct currents for haulage, and polyphase currents for other power.

The use of direct-current machinery for pumping and fans has not been found satisfactory in many instances. One large company after a thorough trial of such apparatus rejected it in favor of compressed air. The pumps in a mine are subject to only rare inspection, and that, oftentimes, by unskilled workmen. These conditions combined with the unfavorable location of the machinery will soon cause electrical troubles in the commutator, or elsewhere, of the most carefully constructed motor. Inasmuch as the stopping of a pump, even for a short time, may cause excessive damage, the use of such a motor is a constant menace.

*Abstract of paper presented at the general meeting of the American Institute of Electrical Engineers, Boston, June, 1899.

The second electric system, that using direct and polyphase currents, has the inherent disadvantage of requiring the installation of two distinct and separate sets of generators and wiring. That is a matter of serious importance, as will be indicated later, but is neither so expensive nor cumbersome as the piping used for compressed air. The great advantage in the use of polyphase currents lies in the fact that they permit the use of a motor that is perfectly reliable under essentially all conditions of operation to be met with in mining. This compound electric system seems without doubt to be the best that can be installed for large operations. It comprises the advantages of all the other systems while eliminating their most serious defects. A system using polyphase currents alone might possibly prove most advantageous, but would have the serious defect of requiring two trolley wires, and even if this difficulty were overcome it would have to await the development of a polyphase motor suitable for a mining locomotive.

The Davis Coal and Coke Company's plant at Thomas, W. Va., is so efficiently equipped with this compound electric service as to be worthy of a short description. The company operates two mines at Thomas, the Thomas drift and the Davis shaft, and one mine at Coketon, a drift. The power station is a roomy brick building containing Ames 200 H.-P. engine direct-connected to a 150 K. W. 500-volt direct-current generator; two Atlas cycloidal heavy-duty engines of 150 H.-P., one of which is belted to a 100 K. W. 550-volt three-phase alternator, and the other to a 76 K. W. 550-volt direct-current generator. The last mentioned generator has been installed temporarily in the place of a second 100 K. W. three-phase 550-volt alternator which had been operated in parallel with the other three-phase alternator. This 75 K. W. machine is used to help the haulage generator.

The coal is hauled by horses from the rooms to convenient points, where it is collected into trips of from 6 to 12 wagons. The inside haulage motor takes these trips and hauls them to a central point of the breast and there they are combined into larger trips of about 15 to 35 wagons and hauled to the mouth of the mine by another similar motor. Each of the haulage motors gives 3,500 lbs. draw-bar pull. At Coketon, two miles away, another 14-ton haulage motor is installed.

The alternating three-phase generator is used for operating three 10 H.-P. induction motors for driving small pumps, one 5 H.-P., one 10 H.-P., two 20 H.-P., and one 30 H.-P induction motors for operating elevators; one 5 H.-P. induction motor for a car lift; and three chain coal cutters. The induction motors for driving the pumps are located at the foot of the side entrance both at Thomas and Coketon. One 10 H.-P. induction motor connected to a pump having a 5-in. suction 250 ft. long, and a 4-in. discharge pipe 750 ft. long, with a total elevation of 28 ft., pumping 106 gallons per minute, was tested and found to take 11,000 watts. Induction motors are also used for driving fans, and conveyors which carry the slack coal from beneath the screens to the bins, where it is stored until needed to charge the coke ovens.

Electric haulage equipments have been so long in use as to be now in a thoroughly good state of development. Even yet, however, the following faults may be observed in some of the machinery: Poorly acting brakes, unwieldy arrangement of the various controlling levers and trolley poles, brake rods or other projections too close to the track, and unsatisfactory speed and power regulation. Although some of these seem of small importance, any one of them is apt to seriously interfere with efficient work. The brakes on a mining locomotive should be very powerful and quick acting; likewise the arrangement of motorman's seat, brake handle, controller and sand-box lever should be such that the motorman can control his machine with the greatest possible dispatch and ease. Locomotives have been placed in mines with absolutely no provision for the motorman, and others where the lever arrangements are so unwieldy as to make the quick control necessary to safe operation impossible. In large coal operations economy is often to a large extent dependent upon the rapidity with which the wagon trains can be moved. Heavy grades both in favor of and against the load are frequently to be found. In order to draw a large load and make quick time, the design and control of the motor should be such as to give an unusually great draw-bar pull at low speed, and at the same time have points of comparatively high speed. This condition is not properly met at present by all of the mining locomotives in operation. In one mine, which has come recently under the writer's observation, a slightly different design and arrangement of control in the locomotive would permit the handling of much larger loads at a great saving. The power-house load curves for haulage are naturally very similar to those of other electric railway work.

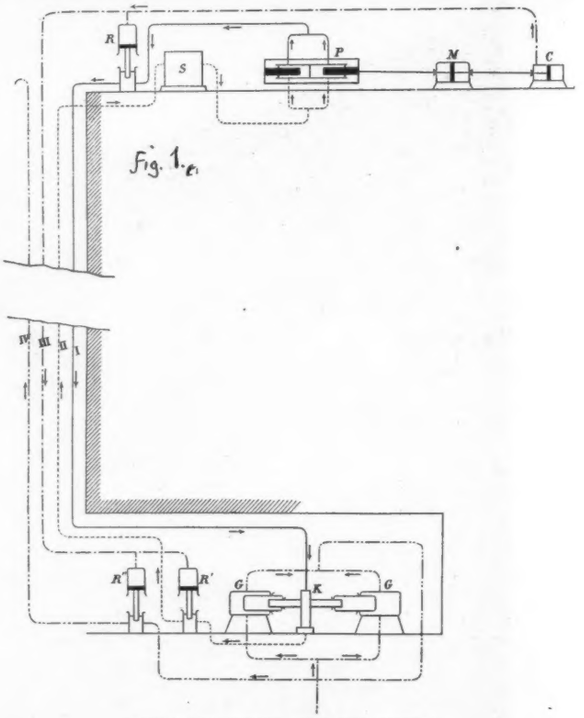
Under suitable conditions under-cut coal cutters will permit a great saving of labor, and therefore of expense, in soft coal mining. But in a large number of cases such cutters have been thrown out as unsatisfactory and have been replaced by compressed air drills or other apparatus. In mines where curve veins abound they have ordinarily given much trouble. The cutter strikes the clay vein and sticks, or worse, bends, causing it to wedge tightly. This necessitates digging out with the pick-axe and expensive repairs. The most serious difficulty seems to arise from poor mechanical design and construction, combined sometimes with electrical faults. It should be possible to overcome these difficulties. In one mine where great trouble of this nature was previously experienced, a new set of machines is now giving great satisfaction.

Electric pumps run by induction motors give very satisfactory service. The conditions met with in mining often necessitate frequent re-location of the pumps, and in this respect the electric pump is by far the most satisfactory. The attention required is certainly a minimum. A particular pump tested ran about 10 hours per day, and the only attention required was that necessary for starting, stopping, and lubrication. Some mine owners have objected seriously to the electric pumps. In most cases these objections have been due to the compact arrangement of the pump and motor. In one mine which came under our observation, a 10 H.-P. pump, which was bought with the motor, was replaced by the water end of a steam pump with a great improvement in the service. If electric motors were made to suit the pumps, and not the pumps to suit the motors, it would go far toward obviating the most serious objections. When the pump must be of large capacity and when it can be located within a reasonable distance of the steam plant, a steam pump would probably show greater economy.

Wiring in mines is subject to certain restrictions which do not apply in ordinary wiring. There is no doubt that the 550-volts used for haulage is dangerous for horses. It is therefore customary in many mines to shut off the trolley current while the mules are being taken in or out of the mines. If a polyphase system is installed for operating cutters, pumps, etc., in the mine, it should be run through the air courses and not through the main gangway. A pressure of 550 volts alternating is much more dangerous than the same direct-current pressure. The class of labor which is usually employed in the soft coal fields is of a low grade of intelligence, and many instances are recorded of serious personal injury or loss of life from accidental or intentional contact with the wires on both 500-volt alternating and direct-current service. Although the mine laborers may have been repeatedly warned of the danger, they continue careless about the wires. When the mine roof is low enough to be reached by the men, the common practice is to run the trolley wire along one side, supported by the usual hangers. When feeders are necessary they should be run along the same side. The other side of the roof should be kept clear.

Ordinary bare wire is preferable in mine work. The best insulation, rubber compounds, deteriorate rapidly under the action of the sulphur water. Any other insulation soon becomes inefficient owing to the moisture which is always present in a mine.

In large operations such as those at Windber, where 20 miles of trolley are already in service, it is undoubtedly advisable to use at least 500 volts pressure for haulage. The polyphase power should preferably be




The Kaselowsky Pumping System.

used at a lower pressure for the sake of safety to employees. This could often be done without an undue expenditure of copper, by carrying high-pressure lines overhead to air ducts, or through unused passages to suitable points for distribution, where the pressure could be lowered by transformers. When it is necessary to run wires down a shaft through which coal is to be hoisted, the best practice would be either to use lead covered cable, or wire which has been insulated with rubber, heavily braided, and drawn into an iron conduit having the ends hermetically sealed. In many instances when wires have been installed without such protection, in old shafts, trouble has resulted from the breaking of the wires, caused by lumps of coal falling down the shaft, etc.

Skilled Employees.—Too much pains cannot be taken to employ careful men as motormen for the haulage motors. The mine track is far from being up to the street railway standard. To haul a long trip of wagons over a bad track, requires careful handling of the motor. The motorman should be trained to study his track and his load, and know when and where to let his trip run slack and where to keep the couplings taut. A case came under the writers' observation where a careful motorman handled a trip of 15 loaded wagons, while another motorman stalled with 10 wagons on the same stretch of track. This matter is a very important one from the mine owners' point of view. The cost of driving gangways and shafts is considerable, and any method which will allow of an increase in the quantity of coal which can be taken from a single opening in a given time, adds very materially to the mine owners' profits.

As the lighting of a mine is a comparatively simple matter, it is scarcely necessary to consider it here. The universal method is to light up all switch points, and only other places of exceptional importance. In large mines using a number of locomotives, an efficient system of signals should be used in the main headings. This should be an automatic block system. Mr. A. S. McAlister of Windber, Pa., has worked out such a system, using incandescent lamps between trolley and rails, which is working admirably.

The question of efficiency, from a fuel standpoint, is of comparatively small relative value, as the difference in actual cost in fuel in the different systems is insignificant, when compared with other expenses. Data available seems to indicate, however, that the all-electric systems lead in this respect. As regards the total commercial efficiency, including maintenance, labor, interest, and depreciation, there can be no doubt but that the compound electric system using polyphase and direct currents, will give the best results.

## THE KASELOWSKY PUMPING SYSTEM.*

By Charles Francois.

The Kaselowsky system of pumping from deep mines utilizes as its motive power water under high pressure. An example of the use of this system is found at the Gneisenau shaft of the Harpen Colliery in the Dortmund District in Germany. A more recent installation is in the Pluto Mine at Wanne in the Ruhr Basin; there the water pressure used is as high as 200 atmospheres, while at Gneisenau a pressure of 100 atmospheres only is employed.

As shown in Fig. 1 the system includes at the surface: 1. A steam engine, M, operating the water compression pumps, P, and the air compressor, C, the latter furnishing the air needed for the regulators.

At the bottom of the shaft: 1. A hydraulic motor, K, of a special form, operating the lifting pumps, G. 2. Two regulators, R′ and R″, for the water pipes.

In the shaft: 1. The pipe, I, conducting water to the pump. 2. The pipe, II, carrying the water discharged from the pump. 3. The pipe, III, carrying compressed air to the regulator. 4. The pipe, IV, for the water lifted from mine.

As shown by the arrows in Fig. 1, the water operating the pump passes from the pump, P, through the accumulator, R, which regulates the pressure, through the pipe, I, to the motor, K, at the bottom of the shaft. After performing the work it is returned to the surface through the pipe, II, on which is the regulator, R′, and is discharged into the reservoir, S, from which the pump, P, is supplied. Only enough water must be supplied to this reservoir to make up for the inevitable waste. This is preferred to permitting the water to escape, because the reservoir may be supplied with pure water, free from the salts which often exist in mine water; thus preventing incrustations in the pipes or corrosion of the metal.

At Wanne the engine driving the compression pump is a compound condensing engine using steam at 150 lbs. pressure. The piston rods work directly two pumps placed together. To withstand the very high pressure these pumps are of cast steel. The plungers are of nickel steel. The valves have a large area and a very short lift, and are held in place by a spring.

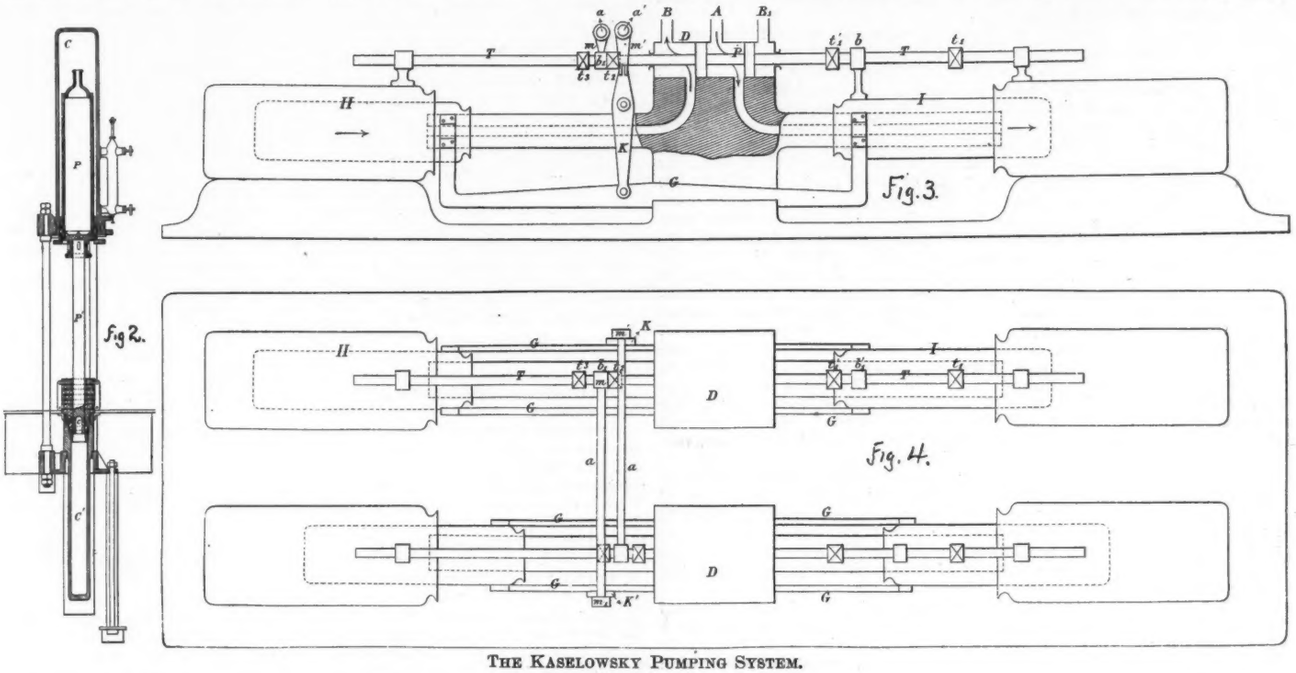
The regulator, shown in Fig. 2, is formed of two cylinders, C and C′, in which are two pistons, P and P′, of such diameters that the ratio between them is 1:10. The water acting on P′ with a pressure of 200 atmospheres is counterbalanced by a compressed air pressure of 25 atmospheres on P. This piston is a hollow cylinder of phosphor-bronze. The pistons being small, the regulator is necessarily long. The water piston has below a small cavity, c, which permits the escape of water in case the pressure rises too high and causes the piston, P′, to lift too far.

The pipe carrying the water under compression to the motor is weldless steel pipe, the joints being kept tight by leather or rubber packing. The loss of pressure through friction is 10 to 12 per cent.

The motor and lifting pump are shown in elevation in Fig. 3, and in plan in Fig. 4. The motor is of peculiar construction. It is composed essentially of two fixed pistons, P P, placed on either side of the distributing chest, D, and communicating with it by the passages, c c′, so as to permit water to enter and leave alternately the cylinders C C′, which move. These cylinders are joined by the connections, t and t′, and act as plungers for the lifting pumps, M and M′. This arrangement reduces the moving parts to a minimum. There are two motors placed side by side, so regulated that their action differs by half the stroke. In this way there is a steady delivery of water into the pipes. The movement of the valves is received from arms or tappets so arranged that the admission valve is opened by the movement of the adjoining cylinder, and closed by that of the cylinder itself. There are no eccentrics nor valve stems.

The speed of the pumps is low, being usually from 15 to 20 strokes a minute.

The principal dimensions of the installation at Wanne are given as an example. The steam engine has two cylinders 0.87 m. diameter and 1.10 m. stroke; it is run at 40 revolutions a minute. The compression pumps have plungers 0.078 m. diameter and 1.10 m. stroke. The pipe which carries water to the motors is 0.060 m. diameter, while the escape or exhaust pipe is 0.070 m. The pipe conducting water from the lifting pumps is 0.180 m. In the regulator the large piston is 0.520 m. diameter and the small piston 0.160 m. The hydraulic motor has the moving cylinders—which are also the pump plungers—0.235 m. diameter and 0.800 m. stroke. The usual speed is 18 strokes per minute. The average duty is 69 per cent. of the theoretical efficiency.




THE KASELOWSKY PUMPING SYSTEM.

*Abstract of paper in the "Revue Universelle des Mines." August, 1899.

COAL EXPORTS OF GREAT BRITAIN.—The exports of coal, coke, cinders and briquettes from the United Kingdom during November were 3,511,483 tons, making the total for the eleven months of the year 39,619,132 tons, as compared with 33,008,265 tons in the corresponding period of 1898, and 34,122,046 tons in the first 11 months of 1897. In November, 1898, 3,453,216 tons were exported, as against 3,192,581 tons in November, 1897.

ONTARIO GOVERNMENT ASSAY OFFICE.—The statement of laboratory work done at the Ontario Government Assay Office, at Belleville, shows a total receipt of 220 samples received for examination during the month of November. The samples sent in for assay consisted of 98 for gold assay, 23 for gold and silver, 35 for copper, 3 nickel, 1 platinum and 1 zinc. The samples for complete or partial analysis comprised 9 iron ores from Eastern Ontario for analysis as to smelting quality, 5 samples of crude and refined salt from the salt beds in Western Ontario, 6 samples of crude and manufactured peat from the peat beds in the various parts of this Province which are being worked, and 4 rocks for partial analysis. Altogether 241 assays and analytical determinations were made during the month. Of these 161 were done for the public on which fees aggregating $161.90 were collected. The Bureau of Mines required 80 assays and analytical determinations from the laboratory, on which no fees were collected. Most of the gold ores were sent in from the Seine River District and show more or less paying values of gold. This district, as well as the Lower Manitou District, is the scene of much activity, due to the rapid extension of the Ontario & Rainy River Railway and the recent improvements of the Government colonization roads. The nickel ores came from the Sudbury District, while the copper ores, showing more or less paying values of copper, were sent in from the different parts of Parry Sound District. All of the iron ores for analysis came from Eastern Ontario, where there are several new properties being worked.

The laboratory has issued a special circular announcing the intention of making a specialty of check assay work, for which purpose mailing bags for ore samples may be obtained free on application.

## THE ARRASTRA AND ITS USE.

In small mines, or in opening new mines, where it is not advisable to put in expensive machinery, there is often need of some cheap and simple device which can be employed in working the ore until its values are thoroughly tested, or until a stage of development has been reached which will warrant the exploitation of the deposit on a more extensive scale. One of the most efficient devices of this kind which has been employed in our Western mines is the old Spanish arrastra, which has been for many generations in use in Mexico and South America, and which the early California miners adopted from their Mexican neighbors. The arrastra is a simple device and in most cases can be constructed from material which can be obtained on the spot or without great difficulty; it is a very close saver of gold; it can be operated by animal power if no other is at hand; and it involves only a very small expenditure for construction and operation. It is true that it is somewhat slow in working, but where the quantities to be handled are comparatively small this is only a minor defect, and is fully compensated for by its other advantages. Its use is and should be generally confined to free-milling ores or those containing only small proportions of pyrites. For outcrop or decomposed surface ores it is generally a most appropriate and convenient device.

In its simpler form—which is also generally the best—the arrastra consists of a shallow circular bed which is paved with very closely set blocks of hard stone. A post is set in the center, usually upon a raised block, and is supported at the top by a rough timber frame in such a way that it is free to revolve. This post carries one or more arms to which the drags are connected by chains. One of the arms extends beyond the outer circle of the bed, and to this the motive power can be attached. This power is most usually in the Southwest a mule or burro; in Mexico and Central America one or more peons or Indians are often substituted for the four-legged engine.

The stone bed of the arrastra is usually laid upon a foundation composed of a layer of clay or soil beaten down as hard as possible; where it can be had concrete can be advantageously used for the bed. It should project for 2 ft. or so outside of the arrastra floor all around in order to prevent any quicksilver which may escape from soaking into the soft earth. Around the bed there must be a curb or wall to prevent the pulp from escaping; this may be of stone or of wood as is most convenient. Sometimes the bed of the arrastra is sunk below the surface, and in that case the curb may be simply earth rammed hard. Probably the most satisfactory curb is made of wooden staves. The height will vary from 18 in. to 4 ft., or perhaps more, according to the size and the quantity which it is proposed to treat. The bed should be made of blocks of hard stone fitted together as carefully as possible and evenly laid. The larger the stones the better, as there will be fewer joints to make. The joints should be filled in with cement where it can be had, or with good hard sand well rammed in. The choice of stone will in most cases be determined by the neighborhood. Granite and quartzite are generally considered good. If possible it is better to have a stone that will not wear smooth by friction but will retain its roughness of surface, as the efficiency of the grinding is less when the stones are worn smooth.

In the more elaborate machines the central post is shod at the bottom with iron and carries an iron pin. A cast-iron shoe may be used as a support and an iron bearing also at the top. While these are to be preferred, of course, they are not indispensable and good work has been done with wooden shoes and bearings, which can be worked out very fairly with ordinary tools. The number of arms carried by the post will depend upon the size of the arrastra and the power used. Where a mule is the operator a plain arm to the end of which he can be attached is all that is required. In more elaborate constructions the central post may carry a bevel gear at the top which will mesh with a pinion carried on a shaft driven either by a water wheel or a steam engine.

The drag-stones or grinders are attached to the arms which project from the post. They are usually stones as large and heavy as can be procured, and are of the same materials as the bed-stone. The face must be flat and the stone itself should be nearly flat also and a little wider on the face than on the back, so as to avoid any tendency to turn over while running. Two eye-bolts are secured in the top of the drag-stones, either leaded in or screwed into wooden plugs driven into holes made in the stone. Chains or raw-hide ropes extend from these eye-bolts to the arms, and should be so arranged that their length can be varied as found necessary. The general custom is to make one of the ropes or chains a little longer than the other, so that the front of the drag-stone forms an angle with a radius drawn from the center of the arrastra. The object of this is to secure a better turning over and mixing of the pulp. The stone is so hung that the front end is raised a little from the bottom; if it rested flat it would have a tendency to push aside the particles of quartz instead of drawing them underneath and grinding them. The number of drag-stones varies; in a small machine only two may be used, and sometimes the number is as high as eight, but four is probably the most usual number. A drag-stone 200 lbs. in weight is about the smallest that should be used, and stones of 600 or 700 lbs. each are not uncommon. The diameter of the arrastra, of course, varies, 8 ft. being about the smallest, while 12 ft. is quite common, and they are sometimes built up to 20 ft. in diameter. For a 12-ft. arrastra the width of the pavement or grinding bed would be 4 ft. or a little over. The number of revolutions where mule power is used is about six per minute; where water power or steam is available they may be run up to about 12 a minute.

After an arrastra has been built it should be run for several days on barren quartz or sand until the running is comparatively smooth, and the cracks in the floor have been well filled up. After it is ready for use the ore is charged in, the quantity varying with the size of the machine, the hardness of the ore, and the fineness to which it has already been broken. Where a rock-breaker is available it will, of course, be used, but where the stone must be broken up by the hammer it will naturally be turned over to the machine in larger pieces. In Mexico the ore for the arrastra is usually picked over very carefully by hand before breaking, in order that as little barren rock as possible may be charged. A usual charge is broken ore sufficient to form a bed 1½ or 2 in. deep all over the floor. This is spread uniformly over the bed, damped down with water, and the drags started. After the ore has been ground fairly fine, water enough is added to make it rather a stiff paste. When it has been well mixed quicksilver is thrown in; generally sprinkled over the surface of the pulp as uniformly as possible. One accepted way of doing this is to squeeze the quicksilver through a piece of fine canvas, breaking it up into globules. The quantity used is generally about three times that of the gold or silver supposed to be in the ore. It is a very common practice to put it in gradually in small quantities, taking out samples of the pulp from time to time, and panning them out in order to ascertain whether any amalgam is forming. The experienced miner will readily see from the result of this panning whether it is best to add any more quicksilver. The consistency of the pulp is an important point; it should be thin enough to allow the drags to work through it easily and smoothly, but not so thin that the quicksilver will sink to the bottom and collect in the depressions of the bed, where it would do little or no good.

The arrastra is a fine grinder and amalgamator, and does its work well if allowed sufficient time, but it cannot be pushed or hurried. For this reason it is not adapted for large plants where great quantities of ore are to be worked, nor is it suitable for very low grade ores, as its operations are too slow to make such ores yield a profit.

When the amalgamation is considered complete the pulp is drawn off. Arrangements are usually made for this by making gates or openings in the curb; generally there are several at different levels, all discharging into a sluice-box. Water is run in to thin the pulp and wash out the ground ore. As a rule most of the amalgam remains on the bottom of the arrastra; but if the gold is fine the sluice-box should be provided with amalgamated copper plates, or with riffles. Where there are sulphurets in the ore which it is desirable to save, blankets may be used. When the pulp has all been drawn off a new charge is introduced, and the operation begun again. The time required for working one charge varies very much according to the nature of the ore and other considerations; probably from 6 to 12 hours will be the limit, and the quantity of ore worked will also vary from the same causes.

A partial clean-up is made every week or two, when the arrastra is cleaned out, its contents being removed as closely as possible by scoops and stiff brushes; no attempt, however, is made to scrape out amalgam which may have worked its way down into the cracks, this being left for a general clean-up. The material collected is washed out in pans or a cradle in the usual way to separate the amalgam, and also to recover any sulphurets or other material which it may be thought best to save.

A general clean-up is usually made only when the stones of the bed or floor are so far worn out that they have to be replaced. When this is done the stones are taken up, carefully scraped and cleaned to save any particles of amalgam which may adhere to them. The sand on which the stones were laid is carefully panned out, and frequently the hard earth or clay bed is scraped off, and the upper part washed. A new pavement is then put down if work is to be continued. The length of time which a pavement will last is very variable, as may be supposed. It depends upon the nature of the stone of which the bed and the drags are made, the nature of the ore ground, and some minor considerations. It may happen sometimes that where a prospector has been engaged in the work the machine may be abandoned altogether. In that case there is at least the satisfaction of knowing that no very heavy expense has been incurred in setting up the machine. Time and labor have been lost, of course, but no considerable amount of money.

Many attempts have been made to improve upon the arrastra to increase its speed and to make it a more modern machine in appearance. If old miners are to be believed, these attempts to modernize the machine have not been improvements, and more efficient work can be done with the old-style stone-bed than with any of the so-called improvements. Possibly this is true, for although many of the principles of the arrastra have been embodied in improved machines, the original device was specially adapted to the condition under which it was used. It has been improved somewhat by the experience of centuries, while retaining the same general character and form which it originally had, and in all probability it will always have a place in mining which can be filled in no other way.

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COLOMBIAN EMERALD MINES.—The Colombian Ministry of Finance has been asking for bids for leases of the emerald mines of Muzo and Cosenez. The leases are to be for a term of 15 years.

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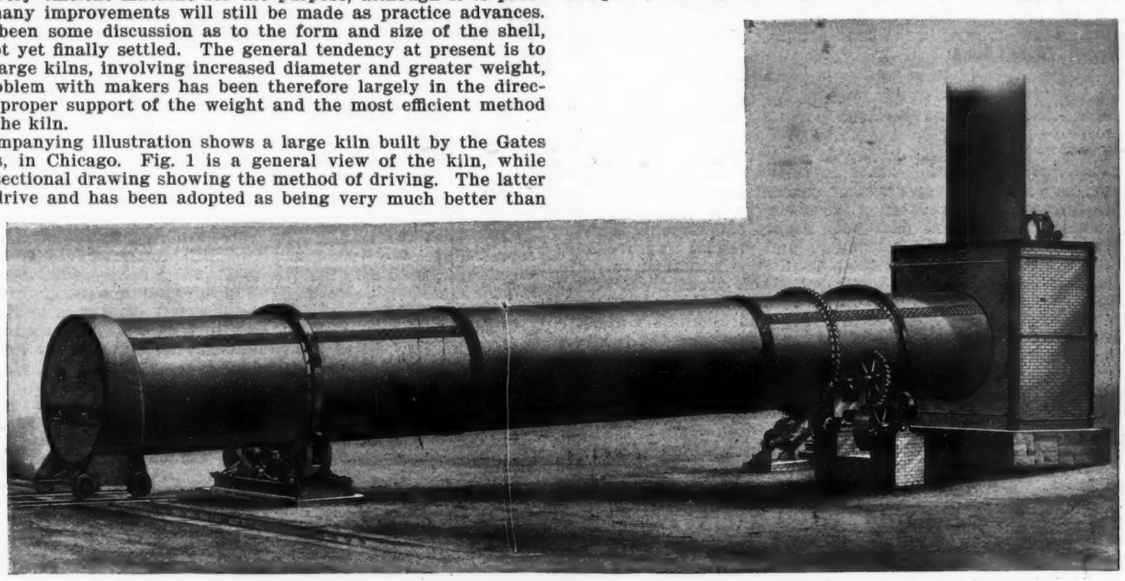
THE COLOR OF GEMS.—According to Tschermak, the formation of the color of precious stones and other minerals is not easily explained in the majority of cases. The dye-stuff contained in them may belong to an organic as well as inorganic compound, but almost always its quantity is so small that it does not suffice for a chemical analysis. In the mineral, zircon, which is much used as a gem, especially under the name of hyacinth, the yellow, green, red or brown color can be ascribed to the presence of nitrogen, and the same thing has been proven for the well-known smoky quartz, which is very often erroneously called smoky topaz. The origin of the coloring of the amethyst has not been determined as yet, but the opinion that it was due to the presence of a compound of sulphocyanide with iron, has been found to be wrong. In many minerals the color is caused by the presence of chrome. This has been a long-established fact as regards certain varieties of garnet, spinel and diopside (a variety of augite). But other highly-prized gems owe their color to chrome, as the red and violet spinel, the ruby, the sapphire, the oriental amethyst, the green zircon, and the topaz of Villarica, Brazil. In the ruby and the sapphire, it is true, chrome could not be discovered direct, but it was established in the opposite way, that the combination of the elements constituting the said gems and potassium bichromate produces colorless metals on the one hand, but also red, blue, yellow and green ones. Thus, numerous other examples might be cited, in which the cause of the coloring of minerals might be ascertained, but a much larger number of colored minerals remains, whose color the chemists have not yet explained.

## THE GATES ROTARY CEMENT KILN.

The rotary kiln for calcining cement clinker is now the generally accepted machine at all cement works of the latest and best design. Its use has passed the stage of controversy, although there is still considerable difference of opinion as to the minor details. Experience has led to many alterations and improvements and has made it possible to produce a very efficient machine for the purpose, although it is probable that many improvements will still be made as practice advances. There has been some discussion as to the form and size of the shell, which is not yet finally settled. The general tendency at present is to the use of large kilns, involving increased diameter and greater weight, and the problem with makers has been therefore largely in the direction of the proper support of the weight and the most efficient method of driving the kiln.

The accompanying illustration shows a large kiln built by the Gates Iron Works, in Chicago. Fig. 1 is a general view of the kiln, while Fig. 2 is a sectional drawing showing the method of driving. The latter is a chain drive and has been adopted as being very much better than



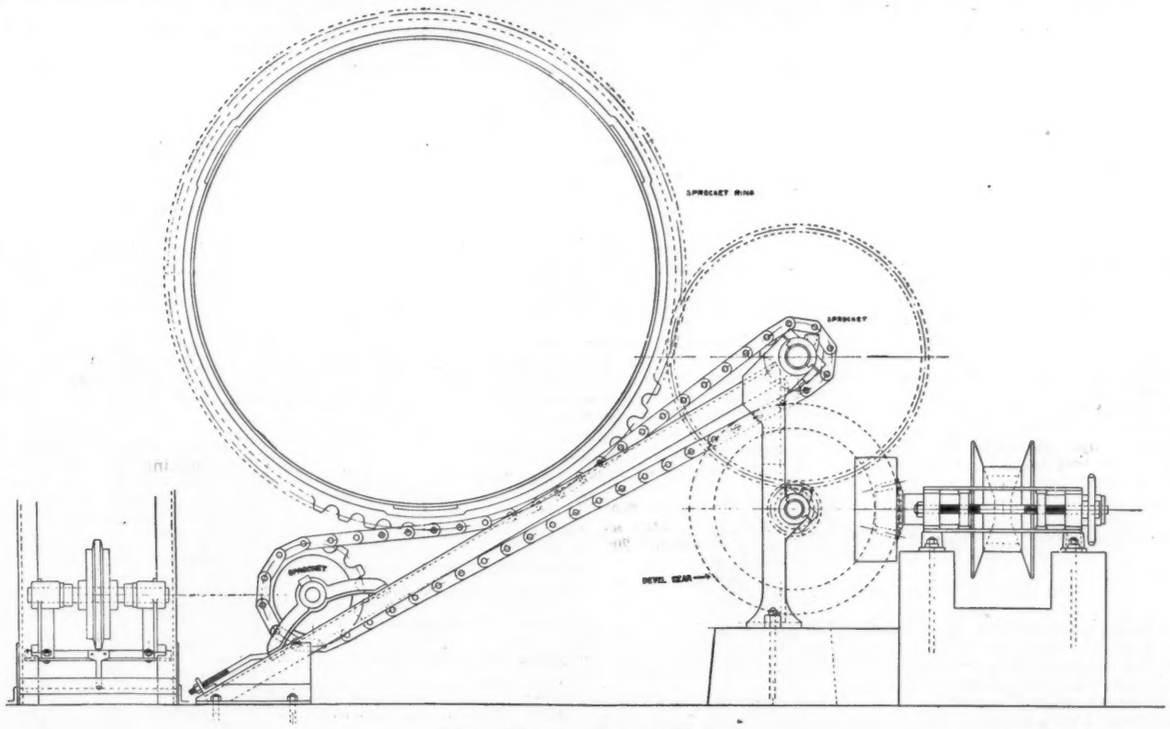
GATES ROTARY CEMENT KILN.

gearing of any kind. Owing to the deflection which almost always occurs it has been found difficult if not impossible to keep the gear wheels in proper line, and for this reason the chain was adopted on account of its greater flexibility. In some cases cement people have preferred the gearing, but as a rule the chain is at once accepted as an improvement. The section in Fig 2 will give a very clear idea of the arrangement, which is very simple in its details and hardly requires any further description.

The Gates kiln is provided with only two carrying rings, as it is necessarily much easier to keep two bearings in line than three or more. With the two bearings a considerable deflection of the cylindrical body of the strain upon the bearings. It has often happened that this has resulted in shearing of the rivets and the eventual destruction of the body of the kiln.

In the Gates kiln the carrying rollers or idlers have their shafts pressed into place by a hydraulic press, and no keys are used; so that the shaft is not weakened by turning a shoulder or cutting key-ways. The equalizing levers in which these rolls are journaled are each cast in one piece, making them rigid so that they do not get out of line. The bearings for the roller shells are provided with caps which are chambered for waste, so that steady lubrication is secured.

Of course, different methods of driving the kilns are in use; that most generally recommended is a small steam engine to be used for each kiln, so that the speed of rotation can be changed if desired. Where such an engine cannot be conveniently used, a variable motion drive is necessary.




CHAIN DRIVE OF ROTARY KILN.

apparatus; but where three are used a slight warp will change the disapparatus; but where three are used a slight wark will change the distribution of the load so that the kiln will alternately throw its entire weight upon the center bearing or upon the two end bearings. This will in a short time cause a severe wrenching of the shell, to say nothing

PEAT IN ONTARIO.—Under charge of the Bureau of Mines of the Province, a detailed report on the peat industry in Ontario will soon be issued, giving an account of the extent of the numerous available peat beds, analyses of raw and manufactured peat as made into briquettes by the Dickson compression patent, with the probable value of peat as a fuel for domestic and commercial purposes. This report will be of great interest to people in the coal and wood trade.

## ABSTRACTS OF OFFICIAL REPORTS.

### Sulphide Corporation, Limited, New South Wales.

This company was originally organized to treat the zinc-lead ores of the Broken Hill region in New South Wales by the Ashcroft process. That process having been abandoned, the company now operates the Central Mine at Broken Hill, which it purchased, treating the ores by concentration and smelting. It has a large concentrating plant at Broken Hill, and smelting works at Cockle Creek.

The quantity of ore treated in the concentrating plant and the product was as follows, in net tons:

| | First half. | | Second half. | | Year. | |
|---|---|---|---|---|---|---|
| | Tons. | Per ct. | Tons. | Per ct. | Tons. | Per ct. |
| Total ore treated | 99,278 | .... | 102,133 | .... | 201,411 | .... |
| Concentrates | 19,715 | 19.9 | 21,274 | 20.8 | 40,989 | 20.3 |
| Zincs | 1,020 | 1.0 | 1,318 | 1.3 | 2,338 | 1.2 |
| Middlings | 20,068 | 20.2 | 21,105 | 20.7 | 41,173 | 20.4 |
| Slimes | 7,535 | 7.6 | 8,590 | 8.4 | 16,125 | 8.1 |
| Tailings | 50,940 | 51.3 | 49,846 | 48.8 | 100,786 | 50.0 |

The report says: "The proportion of concentrates produced to ore treated has increased 1.97 per cent; the recovery of lead being 70.3 per cent. The milling returns have been highly satisfactory, showing in the more important details a continuous and gradual improvement; and although the larger portion of the slimes have been favorably disposed of, later developments in the treatment of this product will permit in the future of an increased recovery of both silver and lead being made; nevertheless the maximum recovery of lead obtainable, consistent with a payable treatment of the slimes, will not raise the recovery above 73 per cent. approximately, as any further increase can only be obtained by finer grinding for the liberation of the lead, thereby increasing the difficulties of producing a high grade zinc."

The cost of producing and preparing ore, reduced to United States currency, is as follows: Mining, including handling waste and filling, $2.37; development, $0.24; traction, crushing and maintenance, $0.18; concentration, $0.73; total, $3.52 per ton. The total contents of the ore treated, by assay, were 37,277 tons lead, 44,362 tons zinc, and 2,510,033 oz. silver.

The report of the manager of the smelting works at Cockle Creek shows results as follows:

| Total smelted, net tons. | First half. | Second half. | Year. |
|---|---|---|---|
| Concentrates | 12,615 | 18,690 | 31,305 |
| Ore residues, Ashcroft | 1,369 | 1,363 | 2,732 |
| Dry ore from Central Mine | .... | 67 | 67 |
| Purchased ores | 737 | 676 | 1,413 |
| Matte and flue-dust | 715 | 326 | 1,041 |
| Total | 15,436 | 21,122 | 36,558 |

The total product for the year was 18,596 tons lead bullion, containing 946,855 oz. silver and 1,787 oz. gold; and matte containing 876 tons lead and 91,140 oz. silver. The total silver produced was 1,037,995 oz. The approximate averages were 50.5 per cent. lead, 28.4 oz. silver and 0.05 oz. gold to the ton.

The directors' report says: "The credit balance from the profit and loss account amounts to £131,218, and after charging £11,064 to depreciation account and £5,000 interest on debentures, a net profit remains of £115,154, which will admit of the payment of a dividend of 10 per cent. upon the preference shares, and 10 per cent. upon the ordinary shares, leaving a balance of £18,904 to be carried forward to the credit of the current year. . . .

"In last year's report, it was pointed out that there were good prospects that the zinc tailings and other residues which had hitherto been treated as of little value, would become an element of revenue. Contracts have since been entered into for the sale, on satisfactory terms, of 66,000 tons of middlings, 25,000 tons of slimes, and 10,000 tons of zinc concentrates, which are now in course of delivery. As the output of residues exceeds 3,000 tons per week, the shareholders will appreciate the importance of a profitable market for them having been secured Experiments have been continued both at the mine and Cockle Creek, having in view the enrichment of the zinc residues, and the establishment of a satisfactory method of subsequent treatment. These experiments have proved that the grade of zinc can be materially and inexpensively enhanced by the application of a magnetic method of separation, for which patents have been obtained. The residues in this form can be disposed of by sale, or treated at Cockle Creek, should further experiments there show it to be desirable.

"The construction work during the year has included the erection of a third furnace and increased roasting plant at Cockle Creek, and the building of a new branch line of railway at Broken Hill, which will be of great service in cheapening and facilitating the delivery of products. The main shaft has also been sunk from the 600-ft. level and has now reached the 700-ft. level, the ore at this point being fully as good as at the higher levels. At the 600-ft. level, which has been extensively opened up during the past year, the ore body is of great magnitude, attaining a width of 270 ft."

## COLORS OF HEATED STEEL CORRESPONDING TO DIFFERENT DEGREES OF TEMPERATURES.*

By Maunsel White and F. W. Taylor.

There is, perhaps, nothing more indefinite in the industrial treatment of steel than the so-called color temperatures, and as they are daily used by thousands of steel workers, it would seem that a few notes on the subject would prove of general interest.

The temperatures corresponding to the colors commonly used to express different heats, as published in various text books, hand books, etc., are so widely different as given by different authorities, it is impossible to draw any definite or reliable conclusion. The main trouble seems to have been in the defective apparatus used for determining the higher temperatures. The introduction of the Le Chatelier pyrometer within the last few years has placed in the hands of the scientific investigator an instrument of extreme delicacy and accuracy, which has enabled him to determine the temperatures through the whole practical range of influence, and led to the establishment of new melting and freezing points of various metals and salts, which are now accepted as the standard in all scientific investigation. There have not, however, been published any results with the Le Chatelier pyrometer seeking to establish a correspondence of temperature with color heats.

The first work done in this line, of which we are aware, is that of Dr. H. M. Howe, some eight or nine years ago. His results, however, have not been published, and with his kind permission we are enabled to give them here:

| | Deg., C. | Deg., Fahr. |
|---|---|---|
| Dull red | 625 to 550 | 1,022 to 1,157 |
| Full cherry | 700 | 1,292 |
| Light red | 850 | 1,562 |
| Full yellow | 950 to 1,000 | 1,742 to 1,832 |
| Light yellow | 1,050 | 1,922 |
| Very light yellow | 1,100 | 2,012 |
| White | 1,150 | 2,102 |

The nomenclature used for color heats differs with different operators, but in our investigation we have adopted that which seems more nearly to represent the actual color corresponding to the heat sought to be represented. We have found that different observers have quite a different eye for color, which leads to quite a range of temperatures covering the same color. Further, we have found that the quality or intensity of light in which color heats are observed—that is, a bright sunny day, or cloudy day, or the time of day, such as morning, afternoon, or evening, with their varied light—influence to a greater or less degree the determination of temperatures by eye.

After many tests with the Le Chatelier pyrometer, and different skilled observers working in all kinds of intensity of light, we have adopted the following nomenclature of color scale with the corresponding determined values in degrees Fahrenheit as best suited to the ordinary conditions met with in the majority of smith shops:

| | Degrees. |
|---|---|
| Dark blood red, black red | 990 |
| Dark red, blood red, low red | 1,050 |
| Dark cherry red | 1,175 |
| Medium cherry red | 1,250 |
| Cherry, full red | 1,375 |
| Light cherry, bright cherry, scaling heat, light red | 1,550 |
| Salmon, orange, free scaling heat | 1,650 |
| Light salmon, light orange | 1,725 |
| Yellow | 1,825 |
| Light yellow | 1,975 |
| White | 2,200 |

The scaling heat (1,550°) is the heat at which scale forms and adheres, that is, does not fall away from the piece when allowed to cool in air.

With the advancing knowledge of, and interest in, the heat treatment of steel, the foregoing notes, it is hoped, may prove of some value to those engaged in the handling of steel at various temperatures, and lead to further and wider discussion of the subject, with a view to the better understanding and more accurate knowledge of the correct temperatures. The importance of knowing with close approximation the temperatures used in the treatment of steel, cannot be over-estimated, as it holds out the surest promise of success in obtaining desired results.

This demand for more accurate temperatures must eventually lead to the use of accurate pyrometric instruments; but at present the only available instruments do not lend themselves readily to ordinary uses, and the eye of the operator must be largely depended upon; therefore, the training of the eye, by observing accurately determined temperatures, will prove of much material assistance in the regulation of temperatures which cannot be otherwise controlled.

* Paper presented at the New York meeting (December, 1899) of the American Society of Mechanical Engineers.

## NOTES ON PLATE AMALGAMATION.*

By George E. Collins.

The results tabulated below were obtained at the Reynolds mill, White County, Ga. They were noted, not with a view to investigating the point discussed by Mr. Clark in his paper, but in course of a test on a working scale to determine the comparative saving from a given free-milling ore on copper and silvered plates respectively. In every case the bullion assayed was the result of a separate clean-up on a considerable quantity of ore. The ore varied widely in grade and in other respects, but the runs bracketed in the table were made at the same time, in adjoining batteries, and similar types of ore. In a few cases (so noted) the

| Month. | Plate. | Fineness of bullion. Gold. | Silver | Ratio, gold to silver. |
|---|---|---|---|---|
| December, 1898 | Silver-plated | 819 | 141 | 5.81 to 1 |
| | Silver-plated | 769 | 181 | 4.25 to 1 |
| | Copper | 884 | 99 | 8.93 to 1 |
| January, 1899 | Silver-plated | 775 | 108 | 7.18 to 1 |
| | Copper | 855 | 117† | 7.31 to 1 |
| February, 1899 | Silver-plated | 720 | 143 | 5.04 to 1 |
| | Copper | 822 | 67 | 12.27 to 1 |
| February, 1899 (same ore) | Silver-plated | 639 | 151 | 4.23 to 1 |
| | Copper | 619 | 82 | 7.55 to 1 |
| March, 1899 (same ore) | Silver-plated | 798 | 107 | 7.46 to 1 |
| | Copper | 732 | 72 | 10.17 to 1 |
| March, 1899 (same ore) | Silver-plated | 801 | 180 | 4.45 to 1 |
| | Copper | 770 | 207† | 3.72 to 1 |
| April, 1899 (same ore) | Silver-plated | 821 | 162 | 5.07 to 1 |
| | Copper | 867 | 127 | 6.82 to 1 |
| April, 1899 | Silver-plated | 808 | 188 | 4.30 to 1 |
| | Silver-plated | 852 | 144 | 5.92 to 1 |
| | Copper | 754* | 91 | 8.29 to 1 |
| April, 1899 | Silver-plated | 859 | 117 | 7.34 to 1 |
| | Copper | 892 | 90 | 9.91 to 1 |

*Result modified by the addition to bullion shipment of a little impure bullion left over from previous clean ups.

†Copper-plate was in strips, which were taken up at these runs and the under surface cleaned.

*Note submitted at the California meeting of the American Institute of Mining Engineers, in response to note of A. J. Clark. See "Engineering and Mining Journal," September 30th, 1899, page 394.

ore was specially mixed, fed from the same bin, and for practical purposes identical. The assays are quoted from the certificates of the United States Assay Office, Charlotte, N. C., to which the retorted bullion was shipped.

Ii will be seen that the fineness of the bullion obtained, both as to the gold and silver, showed extraordinary variations, due presumably to changes in the ore; but that as a general rule the silver ratio of that from the battery provided with the silvered plate was decidedly higher. At first sight these results fit in with the theory suggested by Mr. Clark, that there is a tendency for the silver in the pulp to resist amalgamation on an amalgamated copper plate, as compared with a silvered plate.

The figures, however, do not tell the whole story. The mortars in the Reynolds mill are similar to the "Hall" type, but designed for 750-lb. instead of 450-lb. stamps. Most of the amalgam is really collected in the mortar-box, around and behind the liners, and is only flushed out on the plates in the course of the clean-up. The proportion originally deposited in the mortars varies, of course, as the gold in the ore is finer or coarser, but will be from 40 to 85 per cent. of the total. If, therefore, we confine our attention to the amalgam deposited on the plates in the first instance, the difference in fineness will appear so great that we can hardly ascribe it altogether to a greater affinity of the silver in the pulp for the silver-plated surface.

Every millman knows that the silver on an electro-plated plate tends to wear off in course of time, especially when low-grade ore is run over it; and this loss of silver may continue indefinitely, on a small scale. Similarly, at custom mills it is often found that ore, however barren, run over a copper plate which has become well coated, will abstract some of the amalgam from its surface. At Black Hawk, Colo., there is (or

same ore, battery A fitted with old silvered plate, and battery B fitted with new silvered plate:

| | | Ounces Amalgam. | Ounces Melted bullion. | Fineness of bullion. Gold. | Fineness of bullion. Silver. | Ratio, gold to silver. |
|---|---|---|---|---|---|---|
| A | Collected in mortar..... | 10.76 | 6. | 900 | 91 | 9.89 to 1 |
| | Deposited on plate..... | 5.69 | 1.35 | 794 | 160 | 4.96 to 1 |
| B. | Collected in mortar..... | 12.21 | 6.98 | 933½ | 60 | 15.56 to 1 |
| | Deposited on plate..... | 10.81 | 2.98 | 805 | 185 | 4.35 to 1 |

The relative quantities of amalgam and gold obtained from the two batteries must not be taken into consideration, as, owing to the breakage of a cam in battery A, the quantity of ore put through was unequal.

To some extent, this test corroborates the former results; the difference in fineness of the gold from the two mortars, fed with the same ore and under identical conditions, is, however, perplexing. The writer questions whether the heavy silver-plating—2 or 3 oz. per square foot—sometimes adopted in gold-mills, is not a mistake, and whether it would not be more economical to use a thin coating—1 oz. or less—renewing it, if necessary, as the silver wears off.

## TESTS OF STAMP SHOES AND DIES.

The accompanying illustration is the reproduction of a stamp shoe and die, taken out after wear in the mill of the Village Main Reef Gold Mining Company in the Witwatersrand District of the Transvaal. They were furnished for the mill by the works of Arthur Koppel, through the Johannesburg agency.

In a special test made in May-August last in this mill of shoes and

WORN KOPPEL SHOE AND DIE FROM STAMP MILL.

was) a trick among unscrupulous ore-haulers out of a job, of bringing in worthless ore from some convenient dump and hauling it in small lots to different mills, in the hope than one or other of the loads would be run over a plate in direct succession to a lot of rich ore, and so would yield something at the expense of the mill's bona fide customers.

The loss of silver was plainly noticeable on the surface of the plate at the Reynolds mill. Up to May, 1899, when the above-noted tests terminated, about 170 oz. of bullion had been removed from it, with an average silver assay, in the cases recorded, of 0.041 in excess of that from the copper plate; so that the total excess of silver only amounted to 6.97 oz. May not this have been derived entirely from the plate? Its superficies is 37.33 sq. ft., originally plated with 1 oz. per square foot, or 37.33 oz. of silver in all. Surely it is not unreasonable to suppose that 18.7 per cent. of the total silver on the plate may have been removed with the amalgam in the course of several months. May not part or all of the effect observed by Mr. Clark at the Homestake be accounted for in the same way? The admission of this suggestion will, of course, not affect the general question as to decrease of gold fineness in bullion with increasing distance from the battery.

At the conclusion of the above-noted tests it was established that, notwithstanding the lower fineness of the bullion, the net saving on the silvered plate was in excess of that on the copper plate. The latter was replaced with a new silvered plate, and similar tests were then made on the old and new silvered plates, with the following results:

| Ore. | Plate. | Fineness of bullion. Gold. | Fineness of bullion. Silver. | Ratio, gold to silver. |
|---|---|---|---|---|
| Same ore..... | Old plate | 901 | 81 | 11.12 to 1 |
| | New plate | 876 | 108 | 8.11 to 1 |
| Same ore..... | Old plate | 905 | 87 | 10.40 to 1 |
| | New plate | 893 | 101 | 8.84 to 1 |

As might have been expected, the bullion from the old plate (the most easily removable part of the plating on which had, no doubt, already been taken off with the amalgam) was considerably lower in silver than that from the new plate.

After the reading of Mr. Clark's paper, a third test was made, in which the amalgam collected inside the mortars and that deposited on the plates were cleaned up and assayed separately. The following figures were obtained from a 65-hours' run, both batteries being fed with the

dies from different makers, the Koppel shoes ran 108 days and the dies 120 days, those of the best competing make 110 and 120 days respectively. The comparative wearing test of 6 sets of shoes in use 60 days resulted as follows: Koppel's, 27½ in., 27½ in., 26 in., 27½ in., 26½ in., and 27½ in. The best competing shoes, 26½ in., 27 in., 26½ in., 27 in., 26 in., and 27 in. The average wear per shoe for 60 days was 5.48 in. for the Koppel shoe, and 5.33 in. for the best competitor.

The shoe and die shown in the photograph were in use in the battery for 108 and 120 days respectively. The mill has stamps of 1,200 lbs. weight, and runs on the ordinary banket ore of the Witwatersrand.

COAL-BURNING LOCOMOTIVES IN RUSSIA.—The administrative council for railroads in the southwest of Russia has decided in principle to adopt coal instead of wood for firing locomotives; but, as a sudden change would entail too great expense, the substitution will only be effected by degrees, in such a manner, however, as to be complete about 1903.

THE SHAWINIGAN POWER COMPANY.—The Hon. Warner Miller of New York, whose interests in the paper manufacturing business are very large, has been included in the directors of the Shawinigan Water & Power Company, in the Province of Quebec, says the "Electrical World and Engineer." The I. P. Morris Company of Philadelphia, Pa., has been awarded the contract for two 6,000-H.-P. water wheels for use on the property. These wheels, which are to be completed by June 1st, 1900, will be the largest and most powerful in existence, the next being those of the Niagara Falls Power Company. This contract will be followed by a contract for the electric generators, which also will be the largest and most powerful in the world. The company is making rapid progress in its works and the canal for the development of 50,000 H.-P. is now nearly completed. The Pittsburg Reduction Company, which has contracted for the use of at least 10,000 H.-P., in the manufacture of aluminum, has just let to the R. D. Wood Company of Philadelphia the contract for the wheels, and to the Westinghouse Electric Company of Pittsburg the contract for the generators necessary for the development of 6,000 H.-P. The Shawinigan Carbide Company, which has contracted for 10,000 H.-P., has completed all its plans and is now laying out its site.

## QUESTIONS AND ANSWERS.

(Queries addressed to this department should relate to matters within the special province of this periodical, such as mining, metallurgy, chemistry, geology, mineralogy, machinery, supplies, etc. As it is manifestly impossible to devote space to all the questions and notes constantly received, preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot here undertake to give professional advice on problems requiring special investigation and which should be obtained from a consulting expert. Nor can we undertake to give advice about mining companies or mining stocks. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers should send their names and addresses. Anonymous questions will not be answered. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Ferrochrome.—Are there any manufacturers of ferrochrome in the United States? What is it used for?—H. J.

Answer.—Ferrochrome is an alloy of iron and chromium and the ordinary forms carry about 50 per cent. of chromium. The Wilson Aluminum Company of Holcombs Rock, W. Va., we are informed, is making about 60 tons monthly of ferrochrome that runs from 68 to 70 per cent. chromium, with a carbon content of 1 per cent. for every 10 per cent. of chromium. The company is erecting a new electric plant to develop 7,500 H.-P., at Great Kanawha Falls, not far from Charleston, W. Va. Ferrochrome is used in making Krupp armor plate and armor-piercing projectiles, for high grade tool steel and for stamp shoes and dies.

Bauxite and Alum Shale.—In what States and countries are bauxite and alum shale found? What is the amount produced in this country? What is the amount imported? Would it pay to develop a property containing a large deposit of alum shale, located near a railroad and also accessible by river?—J. S.

Answer.—1. Bauxite is produced chiefly in the United States, France, and Great Britain. France is the largest producer. In the United States the bauxite mined at present is in Alabama and Georgia, though deposits are known to exist in Arkansas and other States.

2. In 1898 the quantity of bauxite produced in the United States was 26,791 long tons. The imports were 1,201 tons and the exports 1,000 tons. Alum shale is not mined in any considerable quantities.

3. It is not possible to give a definite opinion without knowing more of the deposit. Unfortunately, the analysis you send is not clear; it gives 49.98 per cent. "residue," without stating what that residue is; it might contain impurities very injurious to the material. In 1898 there were 97,302 short tons of alum and aluminum sulphate made in the United States; which implies a large demand for the raw material. Your best course is to submit samples to the large manufacturers of alum, who will give you some idea as to its value.

Consult "The Mineral Industry," which treats at length on alum and alum-making minerals.

Locomotive Cinders.—A locomotive boiler, owing to the strong draft, usually throws out a quantity of unconsumed coal among the cinders. Is it possible to utilize this waste?—C. S. McD.

Answer.—Referring to this question, which was published and partly answered in the "Engineering and Mining Journal," December 9th, 1899, page 704, Mr. H. E. Smith, chemist for the Chicago, Milwaukee & St. Paul Railway Company, sends us the following note:

"Locomotive front end cinders have been successfully used by the Chicago, Milwaukee & St. Paul Company for a number of years, being burned under stationary boilers, mixed with a small amount of bituminous coal. They are not briquetted or otherwise prepared. They cannot, however, be classed as fine coal, but are practically coke, as the following analyses will show:

| | 1. Cinders. | 2. Cinders. | 3. Coal. |
|---|---|---|---|
| Moisture | 0.82 | 0.25 | 0.85 |
| Volatile Combustible | 5.97 | 2.40 | 35.76 |
| Fixed carbon | 73.17 | 80.35 | 55.53 |
| Ash | 20.04 | 17.00 | 7.86 |
| | 100.00 | 100.00 | 100.00 |
| Sulphur | undet | 1.14 | 1.76 |

"The percentages of moisture are not significant, the cinders having been cooled with water, and the sample subsequently air-dried. Sample 1 represents cinders made from a mixture of several coals. Sample 2 is from cinders made chiefly from coal represented by sample 3. It will be seen that the coal has lost nearly all of its volatile combustible matter and some of its fixed carbon and sulphur. The cinders are, of course, collected and used entirely free from the ashes taken from the ash-pan and firebox of the locomotive."

Concentrating Sulphide Ores.—Can a sulphide ore containing 22 per cent lead, 20 per cent. zinc, 16 ounces silver to the ton, be treated so as to separate the zinc from the lead by concentration? Does 15 per cent. iron sulphide decrease its value?—F. M. C.

Answer.—The treatment of sulphide ores carrying lead, zinc and silver is a problem which is engaging the attention of many metallurgists. The Broken Hill Proprietary Company, in New South Wales, has established a concentrating plant on a very large scale for the purpose of separating its sulphide ores which carry lead and zinc. The Sulphide Corporation, which undertook to use the Ashcroft process for sulphide ores, but soon abandoned it, is working on the same lines as the Broken Hill Proprietary Company. So far their success has been only comparative. They have succeeded in obtaining a product chiefly lead sulphide, but carrying some zinc; and another product chiefly zinc sulphide, but carrying some lead. The clean separation has not yet been secured, although much time has been spent, and costly experiments have been made.

Some iron sulphide occurs in the ores mentioned, and does not add to their value. It is, however, separated from the zinc-lead sulphides in concentration with comparative ease, owing to the marked difference in specific gravity.

With regard to the silver, it would depend somewhat on its condition and combination in the ore, how much could be saved. Probably there would be some loss in any concentration process.

With regard to the Broken Hill concentrates we may add that the portion carrying chiefly lead is smelted in Australia to lead bullion, and the silver subsequently separated in the usual way. The residues, carrying zinc chiefly, are sold to the Vielle Montagne Company in Belgium and to parties in Germany, who smelt them by processes of their own.

VESSELS OWNED IN THE UNITED STATES.—The report of the United States Commissioner of Navigation for the fiscal year 1899 shows that on June 30th last the number of vessels owned in the United States and their total gross tonnage—excluding boats under 100 tons—was as follows:

| | Vessels. | | Tonnage. | |
|---|---|---|---|---|
| | Iron and steel. | Total. | Iron and steel. | Total. |
| Atlantic and Gulf Coasts | 712 | 16,275 | 685,386 | 2,614,869 |
| Pacific Coast | 75 | 1,970 | 105,996 | 539,937 |
| Northern Lakes | 296 | 3,162 | 572,947 | 1,446,348 |
| Western Rivers | 50 | 1,321 | 11,313 | 263,084 |
| Totals | 1,133 | 22,728 | 1,375,642 | 4,864,238 |

Thus it appears that iron and steel vessels, while they were only 5.0 per cent. of the total number, had 28.3 per cent. of the total tonnage. Of the total number of vessels, 13,300 of 1,825,318 tons, were sailing vessels; 6,837, of 2,476,011 tons, were steamers; 2,591, of 562,900 tons, were barges. The addition to the total tonnage by new vessels built during the year was 300,038 tons, the greatest gain since 1891.

SLAG WOOL IN FIREPROOFING.—Among the recent tests made by the British Fire Prevention Committee was one on a ceiling constructed with silicate cotton, or slag wool, says London "Engineering." The ceiling was used to protect a floor consisting of 3-in. by 9-in. deal joists spaced at 19-in. centers, and boarded with ⅞-in. beaded planks, tongued and grooved. Slag wool slabs 1¾ in. thick were fixed to the under side of the joists, covering the entire area of the ceiling, and were carried down for a distance of 3 in. all around the wall. The slabs were secured in place by 3-in. screws. These slabs were constructed by enclosing the wool between galvanized wire netting of 1-in. mesh. Tongued and grooved boarding ⅞ in. thick was nailed over the slag wool covering, and a wooden cornice was used to cover the portions at the junction of the ceiling and walls. The fire was started at about 4 o'clock in the afternoon, and an hour later a temperature of over 1,800° F. was recorded by the pyrometer. The gas was then turned off and water applied, but to half the ceiling only. During the test the flooring boards got fairly warm, and warped a little, letting smoke through, but were otherwise uninjured. An examination after the test showed the whole of the slag wool in position, and the wirework was in good condition, though the galvanizing had disappeared.

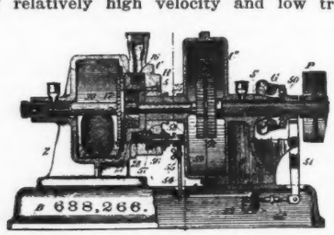
## PATENTS RELATING TO MINING AND METALLURGY.

### UNITED STATES.

The following is a list of the patents relating to mining and metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

Week Ending December 5th, 1899.

638,266. ART OF AND APPARATUS FOR TRANSFORMING ENERGY OF MOTIVE FLUIDS. Nils Nilsson, New York, N. Y., assignor to the Nilsson Power Company of New York. The improvement consists in converting an enclosed high-pressure jet of expansible fluid into a jet of relatively high velocity and low transverse pressure,

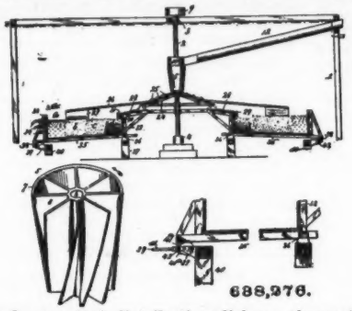



charging into said enclosed jet of low transverse pressure another expansible fluid to increase the density of the first named jet and form an enclosed compound jet also of high velocity and low transverse pressure; and delivering the compound jet to drive a power-generator.

638,267. DIGESTER-LINING. Joshua Norton, Boston, Mass. A lining composed of tiles, laid in courses, with spaces between the courses, the tiles in each course being in close contact with the shell of the digester and with each other, and a cement filling in each space between the courses.

638,276. ORE-CONCENTRATING MACHINE. Thomas S. Ridge, Kansas City, Mo. A machine comprising a shaft, a motor or wheel mounted thereon, embracing a rim or casing and spiral spokes or flukes extending inward of said rim or casing, a stationary hood surmounting said wheel and provided with an opening to receive the

ore-laden water, a vat, an annular table arranged above the inner edge of the vat, a check-rail surrounding and projecting slightly above the outer edge of said table and a slight distance there-

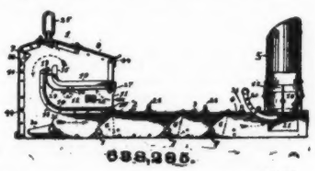


638,276.

from, and a conical distributing-disk amalgamator mounted upon the shaft below said motor or wheel.

638,278. ELECTRODE AND PROCESS OF MAKING SAME. Isaiah L. Roberts, New York, N. Y. The process consists in heating a mixture of pulverized glass and carbon, and then subjecting the mixture to pressure while the glass is in a soft or plastic condition, thereby causing the adherence of the glass particles.

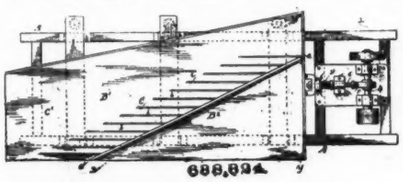
638,285. MINING APPARATUS. Paul Schnetter, San Francisco, Cal. In mining apparatus for frozen ground, a stationary combustion-chamber wholly open at bottom to form a passage for flame along



638,285.

the surface of the ground on which said combustion-chamber rests, a vertical down-take passage at the rear of said chamber communicating with said bottom passage, a grate forming the top of said bottom passage and extending from the front to the rear down-take passage, and articulated extension-flues connected with said bottom passage.

638,324. CONCENTRATING TABLE. Willis G. Dodd, San Francisco, Cal. The combination with the concentrating table, of an overflow-riffle or rib arranged diagonally across the working face thereof,

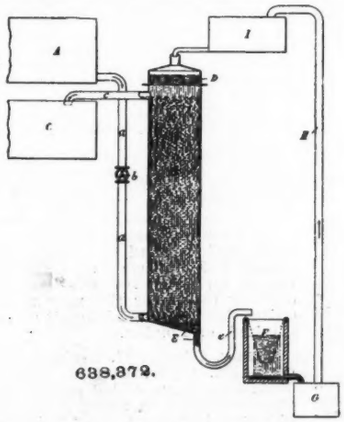


638,324.

and of a series of parallel riffles or ribs joined to said diagonal riffle or rib and extending longitudinally toward the foot or tail of the table.

638,370. MANUFACTURE OF BRICKS, ETC. Edouard Willems, Antwerp, Belgium. The process of manufacturing an enamel applicable to all products made from figuline clay, consisting in first melting together silica, alumina and alkaline matter, and second adding to such mixture while melted one or more metallic oxides.

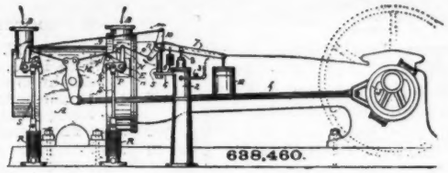
638,372. PRECIPITATION OF PRECIOUS METALS FROM THEIR CYANIDE SOLUTIONS. Martin B. Zerener, London, England, assignor to the Gold Extraction Syndicate, Limited, same place. The process



638,372.

consists in causing the solution to move in one direction and during such movement passing through it, in the opposite direction and in the form of a spray or a number of fine streams or films, mercury charged with alkaline metal.

638,460. AIR COMPRESSOR. John H. Hopps, San Francisco, Cal., assignor to the Fulton Engineering and Ship Building Works, same place. In an air compressor, a fixed arm on the spindle of the inlet-valve; a gripping device mounted loosely on the spindle and adapted to grip the outer end of the fixed arm; means for operating the gripping device from the motor or engine to move the inlet-valve; a tripping device mounted loosely on the spindle and operated by the air-pressure in the receiver or reservoir to disengage the gripping device from the fixed arm of the spindle when the supply of air to the receiver exceeds its exhaust; and a weight or spring connected with the fixed arm by which the valve is thrown wide open when the lever-arm is disengaged from the gripping device.



638,460.

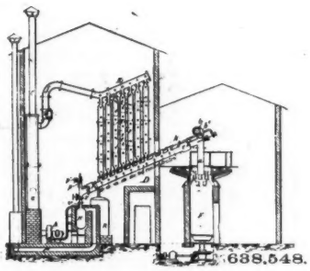
638,472. SECONDARY BATTERY OR ACCUMULATOR. Charles J. Reed, Philadelphia, Pa., assignor to the Security Investment Company of Pennsylvania. The method of preventing deleterious effects in a secondary battery in which active material is deposited upon one electrode or set of electrodes from the battery solution during the charging operation, which consists in subjecting detached particles of active material to localized electrolytic action whereby they are redissolved into the battery solution.

638,485. PROCESS OF MAKING GAS. Maurice Taylor, Paris, France. In the manufacture of gas the step in the process which consists in injecting steam into the generator and introducing into the steam variable proportions of air irrespective of the changes in the volume of steam.

638,497. COATING MATERIAL FOR DECORATING AND BUILDING PURPOSES. Gustave F. Collantier, Paris, France. The composition consists of a compound of solid matter, namely sand, carbonate of lime, phosphate of lime, pumice and talc, in powdered form, and a liquid compound, namely spirits of turpentine, oil-varnish, water, a dryer and white lead ground in oil, these two compounds being mixed together.

638,541. CUPOLA FURNACE. Michael Zippler, Allegheny, Pa. A cupola furnace having its lining formed with an inwardly-projecting fire brick or clay portion at the base thereof, and a metal lining below the same extending backwardly or outwardly from the edge of said projecting portion.

638,548. APPARATUS FOR MAKING PHOSPHORUS. Louis L. Billaudot, Paris, France. An apparatus for the recovery of phosphorus, comprising a gas-tight generator of phosphorus vapors, and a condenser connected thereto and consisting of superposed inclined



638,548.

638,681.

tubes and upright tubes connecting them, the said upright tubes being reduced where they join the inclined tubes so that the aggregate cross-section of the connections is approximately equal to the cross-section of the inclined tube.

638,612. ARTIFICIAL FUEL. Helen M. Van Etten, Moravia, N. Y. The composition consists of mineral coal dust or slack, bitumen, alum, sal-soda, sulphur and whiting.

638,626. LIFT FOR ASPHALT, ETC. Charles L. Cummings, New York, N. Y. A lift comprising a receptacle, a reciprocating valve movable longitudinally of said receptacle, a piston on the stem of said valve, a cylinder, tubes or conduits communicating with said cylinder.

638,681. MINING SHOVEL. Francis D. Koch, Conshohocken, Pa. In combination a receptacle having a hinged top and bottom, a metallic strip arranged on the sides of the receptacle, a loop formed from the strip in the rear, bearings formed on the extremities of the strip, a shaft arranged transversely at the mouth of the receptacle, a brush on the shaft, means for driving the shaft, a handle and connection from the hinged top to the handle.

## GREAT BRITAIN.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy.

Week Ending November 11th, 1899.

21,830 of 1898. LEAD-OXIDE MAKING. The Matthews White Lead Company, Runcorn. Improved plant for making lead oxide by treating molten lead with a jet of heated air and superheated steam.

25,983 of 1898. AMALGAMATOR. A. Lavoix, Paris, France. An amalgamating machine where the pulp is forced through a layer of mercury so as to increase extraction.

26,893 of 1898. SAFETY FUSE. W. F. Reed and E. J. V. Earle, London. A waterproof safety fuse for mining purposes, covered with a layer of celluloid instead of gutta percha.

18,209 of 1899. ORE-FEEDER. W. F. Hill. Ore-feeders for giving a continuous feed from settling tanks to concentrating machines.

Week Ending November 18th, 1899.

23,386 of 1898. ALUMINUM ALLOY. G. E. Bourgoin, Paris, France. Hardening aluminum by adding an alloy of copper, nickel and steel.

24,593 of 1898. MINERS' LAMPS. O. Y. Rhodes, Leeds. Method of lighting miners' oil lamps with electricity without opening.

25,979 of 1898. GOLD PRECIPITATION. F. W. Martino and F. Stubbs, Sheffield. Method of using acetylene freshly generated from carbide for precipitating gold from cyanide solution.

26,457 of 1898. ORE BREAKER. F. H. Cook, Spokane, Wash., U. S. A. Improved arrangement of the jaws of ore breakers.

12,512 of 1899. ROASTING SULPHIDE ORES. E. H. Pape and C. A. Witter, Hamburg, Germany. Roasting mixed sulphides in a powdered form sprayed into contact with the heating furnace.

## PERSONAL.

Mr. T. H. Oxnam has returned to California from a trip to Utah and Nevada.

Mr. C. A. Moreing, of London, Eng., has gone to China to inspect mining prospects there.

Mr. Robert M. Thompson, president of the Orford Copper Company, New York, is now in Europe.

Mr. Walter G. Filer, en route from California eastward, is devoting a week to professional work in Utah.

Mr. H. L. Hollis, mining engineer, of Chicago, is at present in Mexico examining mines for Chicago people.

Mr. A. C. Washington, president of the Horn Silver Mining Company, has returned to New York from Utah.

Mr. R. M. Jesup, of the Gold Coin Mines Company, of Central City, Colo., is spending the holidays in New York City.

Mr. O. H. Baldwin, managing directors of the British Westinghouse Electric Manufacturing Company, is in this country.

Col. W. H. Combs, mining expert, of Denver, is in Chicago in the interest of the Cold Spring Mining Company, of Chicago.

Mr. Clarence Holloway, representing the Ingersoll-Sergeant Drill Company and Frazer & Chalmers in Australia, is now in New York City.

Mr. M. D. Chapman has resigned as vice-president of the Virginia Iron, Coal and Coke Company and the Virginia & Southwestern Railway.

Mr. K. Takeda, a Japanese mining engineer, is in the United States placing orders for mining machinery for some large Japanese copper mines.

Mr. John McCracken, who has represented Fraser & Chalmers at Johannesburg, South Africa, for a number of years past, is now in Chicago.

Mr. L. S. Newell, Jr., of the Concrete Mining Company and Penn Milling Company, of Gilpin County, Colo., is spending the holidays in Pennsylvania and Ohio.

Major Collins, general traveling superintendent of the London & Globe Finance Corporation, has left Rossland, B. C., for Australia, where he will remain for some months.

Mr. R. J. Anderson, general manager of the War Eagle Consolidated Mines, Ida., is to spend the holidays in Philadelphia and will return to Boise City about February 1st.

Mr. F. A. Smythe has resigned his position as manager of the Lorain Foundry Company, at Lorain, O., to become manager of the Thew Automatic Shovel Works at Lorain.

Mr. E. E. Knapp of Chester, Pa., formerly with the Tidewater Steel Company, is to be superintendent of the blast furnaces of the E. & G. Brooke Iron Company of Birdsboro, Pa.

Mr. John Doscher, of New York City, president of the Siskiyou Mining Company, is inspecting the property of the company, on Clear Creek, 15 miles below Happy Camp in California.

Messrs. G. E. Tomlinson and C. E. Webster, of Pasadena, Cal., recently returned from Chloride, Ariz., and are soon to visit the Searchlight and Vanderbilt Districts back of Blake, Cal.

Mr. Charles Forsman of Sharon, Pa., is to manage the melting department of the open hearth steel mill of the Compañia Industrial Mexicana, Chihuahua, the first plant of its kind erected in Mexico.

Mr. Bernard MacDonald has been appointed consulting mining engineer for the British America Corporation. Mr. MacDonald has also been placed in charge of the Le Roi to succeed Mr. W. A. Carlyle.

Mr. A. L. Collins, general manager of the Smuggler-Union Mines at Telluride, has been in Central City, Colo., making progress at the property of the Gold Coin Mines Company, of which he is superintendent.

Mr. George B. Cadwell of Adrian, Mich., visited the Gold Collar property in Gilpin County, Colo., recently, and was the guest of L. H. Stockbridge, secretary and treasurer of the Gold Collar Mining Company.

Prof. W. L. Thompson, of Boston, Mass., accompanied by Prof. F. M. Anderson, of Berkley, Cal., has been examining mining properties in the McKinney Creek District, Siskiyou County, Cal., in the interests of Boston men.

Messrs. Lindley Vinton, R. J. Anderson and S. L. Tipton arrived in Salt Lake City from Boise, on December 13th, for the purpose of closing negotiations for the Checkmate Mine, in Idaho, owned by Utah people. Mr. Vinton and New York associates will be the new owners.

Mr. John H. Vorstman of Milwaukee, Wis., has gone to Lille, France, to take charge of a large establishment now building at that place by the Franco-American Manufacturing Company to make Corliss engines. Mr. Vorstman has been chief engineer of the Filer & Stowell Company.

Mr. J. G. Berryhill and W. C. Harbach of Des Moines, Ia., J. B. Crath of Atlantic, Ia., and A. H. Bergman of Newton, Ia., who are interested in the Crown Point & Virginia Mine in Clear Creek County, Colo., about 2½ miles south of the Gilpin County line, visited that property recently.

Mr. Pope Yateman, manager of the Rand Fontein gold mines of South Africa, accompanied by John B. Pitchford, consulting engineer of the same company; Mr. J. C. Manion, United States Consul at Johannesburg, and Messrs. E. H. and Fred Webster, both American engineers, have been inspecting the copper mines of northern Michigan, paying particular attention to the problems of deep mining as solved by the Tamarack and Calumet & Hecla companies.

Prof. Edward Orton, Jr., who has been appointed State Geologist of Ohio, to succeed his father, the late Dr. Edward Orton, served as an assistant on the Ohio Survey, studying the distribution of the coal measures, and later prepared excellent reports on the clay and clay industries of the State. Since 1894 he has been the director of the department of clay-making and ceramics in the Ohio State University. His appointment ensures the continuance of the excellent work in economic geology which has characterized the later Geological Reports of Ohio.

## OBITUARY.

James W. Reis, general manager of the National Steel Company, died December 17th, at his home, in New Castle, Penn., aged about 35 years. The cause of his death was typhoid fever. He was a brother of William E. Reis, president of the National Steel Company, and was regarded as one of the most promising of the young steel manufacturers of the country.

Samuel Cushman, a Colorado pioneer, who at one time was dean of the State School of Mines at Rapid City, S. D., died of heart disease December 13th, on a sleeping car, near Alliance, Neb., while on the way to Texas for his health.

## SOCIETIES AND TECHNICAL SCHOOLS.

Franklin Institute.—At the meeting of the Mining and Metallurgical section on December 18th Mr. Edward K. Landis presented a paper on the "Tilly Foster Mine," and Dr. H. M. chance read a description of "Some Problems in Deep Coal Mining, with a Description of Some New Methods."

Montana Society of Engineers.—Richard R. Vail and Albert Koberle were elected members of the society at the meeting in Butte on December 9th. The annual meeting will be held at Bozeman on January 12th and 13th. On the morning of January 12th there will be an excursion to the Chestnut Coal Washer and the Chestnut and Trail Creek Coal Mines.

## INDUSTRIAL NOTES.

The Columbian Iron Works and Dry Dock Company of Baltimore, Md., has gone into the hands of a receiver. The company's obligations are put at about $400,000.

C. O. Bartlett & Company of Cincinnati, O., manufacturers of mill machinery, is to supply the Castalia Cement Company of Castalia, O., with a 4-compartment dryer.

The Pittsburg, Pa., Coal Mine Supply Company, which is being organized for the taking over of the business of the Pittsburg Mineral Screen Company, is making efforts to secure larger quarters.

The Exeter Machine Works of Pittston, Pa., manufacturer of elevating and conveying machinery, has opened branch offices at 32 Broadway, New York City, and in the Chronicle Building, St. Louis, Mo.

The Richmond Locomotive and Machine Works, of Richmond, Va., has received from the Chesapeake & Ohio Railway Company an order for 25 22 by 28 in. consolidation freight locomotives weighing 184,000 lbs., each in working order.

The iron and steel works of the Bridgewater Iron Company at Bridgewater, Mass., have been bought by the Stanley Works of New Britain, Conn. It is reported that the Stanley Company will increase the plant by adding an open hearth furnace.

The Duquesne Steel Foundry Company, which recently applied for a charter under Pennsylvania laws, will purchase a 19-acre site at Coraopolis, Pa., on which it will build a new steel plant to cost about $250,000. This plant will employ about 200 men.

The Westinghouse Machine Company of Pittsburg, Pa., at a meeting on December 13th, decided to increase its capital stock from $1,500,000 to $2,000,000 for the purpose of enlarging its plant at East Pittsburg. The present officers were re-elected for another year.

The Ludlow-Saylor Wire Company of St. Louis, manufacturers of mill and mine wire goods, has purchased a tract of land in St. Louis containing 60,000 sq. ft., on which it will erect an extensive manufacturing plant, its present being insufficient for its rapidly increasing business.

The manufacturing establishment of Marland, Neely & Company, Pittsburg, Pa., recently restroyed by fire, has been replaced by a steel frame structure covered with corrugated iron, designed and erected by Wm. B. Scaife & Sons, of that city. The building was completed within 40 days after contract was awarded.

The Merrall's Mill Company of San Francisco recently closed a contract with the Mineral Hill Gold Mining Company of Ballarat, Inyo County, Cal., for 2 rapid discharge 3-stamp mills, 1,200-lb. stamps. These mills will have a combined capacity of 60 tons in 24 hours, or about 10 tons to each stamp.

Loubridge & Company, of Philadelphia, have purchased the 60-acre farm of F. L. Reber, near Shoemakersville, Pa. The firm will put a large force of men at work preparing the ground for the buildings, which will be erected during the winter. The farm contains a large deposit of clay adapted for the manufacture of terra cotta wares.

The stockholders of the Wisconsin Graphite and Mineral Paint Company, of Stevens Point, Wis., have elected the following officers and directors: President, L. J. Seegar; vice-president, John Phillips; Secretary, E. W. Sellers; treasurer, W. W. Gregory; directors, F. A. Southwich, W. B. Buckingham, F. E. Taggert, F. J. Carpenter and A. F. Wyatt.

The M. C. Bullock Manufacturing Company of Chicago has closed orders for hoisting machinery for the Spring Valley Coal Company, and the Sprice Mining Company, and also an order for enlarging the plant of the Montreal Mining Company. It has also sent a diamond drill to Northern Minnesota, and closed a contract for diamond drill prospecting on the Pacific coast of old Mexico.

The report of the Alabama Car Service Association for November shows 39,927 cars handled against 27,548 in November, 1898. The number of cars handled in the 11 months of 1899 is 342,859, an increase over the same period last year of 78,083 cars. During this year the Florence and Sheffield Districts have been taken in and are responsible to a certain extent for the increase. The report for December will probably show some gains over November.

A deed was filed December 14th in Jersey City transferring to the Standard Oil Company for $24,000 and other considerations the property of the National Storage Company below Communipaw. The Standard Oil Company simultaneously filed a deed conveying its oil yards at Constable Hook, Bayonne, to the New Jersey Storage Company, recently organized with $300,000 capital. The incorporators are Charles E. Hodge of this city, James R. Taylor of Mount Vernon and J. W. Crawford of Metuchen, N. J.

The Wheeler Condenser and Engineering Company has secured a contract from the Birmingham (England) Electric Supply Company for a Bernard-Wheeler water-cooling tower, together with a surface condenser, having 3,200 sq. ft. of cooling surface mounted directly upon combined horizontal air and circulating pumps. Bewick, Moreing & Company, of London, have also placed an order for a Wheeler combined condensing outfit for the new mining engines required for the Great Fingall Consolidated Mines, Limited, of London.

Messrs. Charles H. Besly & Company, of Chicago, Ill., report that at their factory, Beloit, Wis., they have added new boilers and engines supplementary to water power and are working 16 hours, 4 days a week, the balance 10 hours per day. The firm is receiving numerous orders for "Helmet" bronze in sheet for flat springs, and in wire for round springs. Owing to advances in raw material, there have been a number of changes in prices in standard machinists' tools and supplies but Messrs. Besly & Company state they will not make advances until after January 1st.

A combination of Naugatuck Valley, Conn., sheet brass and copper manufactories is about consummated, and plans go into operation January 1st, 1900. The concerns are the Ansonia Brass and Copper Company, of Ansonia; the Coe Brass Manufacturing Company, of Ansonia and Torrington, and the Waterbury Brass Com-

pany, of Waterbury. The first-named company is capitalized at $1,500,000, and employs 1,400 hands; the Coe Company at $1,000,000, with 1,600 employes, and the Waterbury Company at $400,000, with 400 employes. Charles F. Brooker, president of the Coe Brass Company, is at the head of the combination.

The Union Brick Company is projected under a New Jersey charter. Alex. S. Porter, of Boston, will be president and R. W. Whitney, of Boston, treasurer. The directors are S. A. Carleton, O. W. Norcross, Worcester, Mass.; J. C. Parry, Cambridge, Mass.; G. B. Parry, New York; Alexander S. Porter, Boston; M. W. Sands, Cambridge; F. C. Parmenter, East Brookfield; W. A. Sanborn, Exeter, N. H., and E. H. Capen, Boston. The company will control 69 brick yards in New England north of Connecticut and Rhode Island, east of the Hudson River, and south of Saco, Me. The value of the yards to be acquired is fixed at $2,782,200. The estimate of the output of the yards for the past year was 325,000,000 bricks.

## TRADE CATALOGUES.

The Ottumwa Iron Works of Ottumwa, Iowa, manufacturers of engines and hoisting machinery and dealers in mine, mill and brickyard supplies, has issued a 48-page pamphlet, 24 pages of which describe the company's hoisting and wire rope haulage engines. These engines, it is said, are made of best material and fitted with an efficient type of balanced valves. The hoists are made geared, friction or direct motion; the double drum hoists have fixed or independent drums. The company makes for tail rope haulage, a double independent drum hoist driven by a patent friction and having post brakes. The bed plate is built in sections to permit of ready handling in shafts or gangways. The company also furnishes endless rope haulage plants. The Ottumwa Iron Works Company, in addition, manufactures steam driven ventilating fans of its own design and mine cars of steel or wood, and rolls, guides or sheaves for wire rope.

Wire rope for many purposes and wire rope attachments are shown in a finely illustrated catalogue of 77 pages published by the Hazard Manufacturing Company of Wilkes-Barre, Pa. The company's works for the manufacture of steel, iron and galvanized wire rope were established in 1848, and the concern is one of the two largest concerns making wire rope in this country. Recently the works have been greatly enlarged and insulated wire and cables for electric work are made. The present catalogue gives specifications of the Hazard standard hoisting and elevator rope; coarse wire rope; extra strong crucible cast steel rope; plough steel and iron and steel flat ropes. These ropes are in use at Pennsylvania colleries in the iron and copper mines of the Lake Superior District, and in the precious metal mines of the Rocky Mountains. The pamphlet gives also much information of value to users of wire rope, including the proper working loads for such rope and remarks on its use, with directions for splicing.

## MACHINERY AND SUPPLIES WANTED.

**If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" what he needs he will be put in communication with the best manufacturers of the same.**

**We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.**

**All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the "Engineering and Mining Journal" are not brokers or exporters, nor have they any pecuniary interest in buying and selling goods of any kind.**

## GENERAL MINING NEWS.

United States Oil Company.—At a meeting of the directors of the company in Boston on December 20th Mr. Joseph S. Ricker, of Portland, Me., was chosen president, to fill the place of Mr. Edward A. Clark, resigned, and Mr. Edward R. Andrews, of Boston, was chosen vice-president. Mr. Clark still remains a director.

### ALASKA.

Lucky Chance.—This mine near Sitka, which belonged to the Lake Mountain Gold Mining Company of Madison, Wis., in which ex-Gov. A. P. Swineford and N. A. Haley of Sitka were principal stockholders, is now the property of Providence, R. I., men, headed by A. P. Weeden.

Pande Basin Gold Placer Mining Company.—There is considerable complaint among the stockholders of this company whose property is in Pande Basin, about 10 miles from Sitka, and whose offices are in New York. The "Engineering and Mining Journal" called attention to some of the extravagant claims put forth in the company's prospectus and gave some facts regarding the history of the Pande Basin placers. No one with any knowledge of placer mining would have been taken in by the company's claims, but some gentlemen in New York allowed themselves to become officers of the concern, rather to the surprise of their best friends. However, the company seems to have honestly expended $75,000 to lower the lake. Last winter it leased its ground to the Sitka Developing Company for 5 years on a yearly rental of $500,000. Some stockholders, however, were carried away by stories of gravel of fabulous richness that apparently were got into circulation in the press by interested parties at Puget Sound cities, and objected to the lease, wishing the company to work the ground itself. The lease consequently fell through. Now reports are coming in which bear out the statements made in the "Engineering and Mining Journal," and the stockholders are wondering where the gold that was said to be in the gravel has gone to. The only explanation offered is that when the level of the lake was lowered a small patch of gravel on one side of the lake slid down into deep water—an explanation that may be ingenious, but is not calculated to satisfy stockholders.

The annual meeting of the company will be held in January, when the company engineer, Henry L. Wiley, who reported the property to be valuable, is expected to be present. If he puts in an appearance some lively discussion is promised.

### ARIZONA.

#### Yavapai County.

St. Louis Copper Company.—This concern has its 10-stamp mill at its claims in the Ajo District, not far from Tuscon, about completed. The incline shaft is down 100 ft.

#### Cochise County.

Anguis.—At this gold mine, 12 miles from Tombstone, a 5-stamp mill is being erected.

Commonwealth.—At this gold mine at Pearce the 30-stamp addition to the 20-stamp mill is about completed.

#### Graham County.

Arizona Copper Company.—This company reports for November a production of 678 tons black copper. For the six months, June-November, inclusive, the total was 4,305 tons black copper.

### CALIFORNIA.

#### Amador County.

(From Our Special Correspondent.)

Bay State.—The 10-stamp mill at this mine, 4 miles north from Plymouth, is crushing at the rate of 40 tons of ore every 24 hours. John Treneman, formerly of the Wildman Mine, is superintendent.

Kennedy.—This mine, 1 mile from Jackson, is producing steadily. The new shaft (east) is down 800 ft. and the north shaft 2,450 ft. J. F. Parks is superintendent.

Keystone.—The high grade rock recently developed at this mine at Amador City is still being extracted and sacked. About 100 men are employed.

Lincoln.—The shaft at this mine, ½ mile north of Sutter Creek, is 1,253 ft. deep, and a chute and station is being cut at the 1,200 ft., preparatory to drifting for the vein channel, supposed to be west of the shaft. On the 500-ft. a west crosscut of about 200 ft. cut a 2-ft. ledge of good milling ore carrying high grade sulphurets. An air compressor and machine drills will be used on the 1,200 ft.

#### Placer County.

(From Our Special Correspondent.)

Mayflower.—The restraining dam at this mine, 1½ miles north from Forest Hill, has been completed and the pipe and monitors are in place ready for work when the water supply will allow. Leasers are still working on a portion of the property.

Pioneer.—At this mine, 1 mile northwest of Damascus, an upraise is being made from No. 4 to No. 3 levels. The mill is crushing 12 hours daily; thirty-eight men are employed under J. J. Sullivan.

Polar Star.—This hydraulic mine at Dutch Flat employs a large force of men, and uses 2,000 in. water under several hundred feet pressure. Four large monitors are operated. William Nicholls, Jr., who owns the property, acts as superintendent.

#### Santa Clara County.

(From Our Special Correspondent.)

Gaudaloupe.—It is reported that this quicksilver mine, 6 miles from Los Gatos, on Guadaloupe Creek, which has been idle since 1880, is now to be reopened about January 1st, under the management of a prominent quicksilver miner.

#### Shasta County.

(From Our Special Correspondent.)

Balakalava.—The first payment of $5,000 is reported made on this group of 26 mining claims, about 7 miles northwest of Copley. The properties are developed by 4 tunnels. The ore body, which carries gold, silver, copper and iron, is said to be extensive. The suit of Conroy and others against Ellis and others in regard to the property is not considered a cloud on the title, as the plaintiffs have sold their interests to the company.

Midas.—In the new shaft at this mine, at Harrison Gulch, at 80 ft., a very rich ledge has been encountered. A 20-stamp mill is being erected. Capt. J. H. Roberts is owner.

Mt. Shasta.—This mine has shut down temporarily, to allow the installment of an electric hoist. The shaft is down 300 ft. When the property is fully equipped it will be worked on a much larger scale.

#### Trinity County.

(From Our Special Correspondent.)

French capitalists are making arrangements to prospect under gravel channels, about 14 miles from Weaverville. A Keystone driller, made by Keystone Driller Company of Beaver Falls, Pa., will be used.

#### Tuolumne County.

(From Our Special Correspondent.)

Black Oak.—At this mine just west of Soulsbyville, some very rich ore has been found. A large force of men is developing the ledge.

Mack.—This mine, on the north side of Big Oak Flat, which has been temporarily closed on account of the breaking of a large pump, has started up again with an increased force. In 2 days the water had reached the 150-ft. mark in the shaft.

Santa Ysabel.—The work of putting in the new hoist and air compressors at this group of mines on the south end of Quartz Mountain is progressing rapidly, and lumber is being hauled in for the new 20-stamp mill. The old mill is running steadily on good ore.

### COLORADO.

#### Chaffee County.

(From Our Special Correspondent.)

Calumet.—The Colorado Fuel and Iron Company, owner of this iron mine at Calumet, has finished dismantling the mine and taken the track, ore chutes, cars, etc., to Wyoming.

Copper Star.—This mine in Dead Horse Gulch, 2 miles from Salida, recently made a fine strike of copper in a drift on the 100 ft. level. The vein is over 2 ft. wide and carries native copper. Samples brought in showed values as high as 40%. The property is owned by E. W. Tomlin and W. P. McBridge of Salida, and was bonded and leased to Rives Bros., and sub-leased by them to the Copper Star Mining Company.

Gold Bug.—In this Turret property recently in the east drift on the 200 ft. level and 200 ft. from the shaft, an ore chute from 5 to 9 in. was opened which assays from 4 to 7½ oz. gold per ton. This is the best strike ever made in Turret District.

#### Gunnison County.

Continental.—This claim at Gunnison has a shaft down 100 ft. A 12 H.P. gasoline hoist is used.

Gunnison.—The shaft at this Gunnison claim is down nearly 300 ft. At the 200-ft. level 8 ft. of $30 ore and 15 ft. of milling ore. Air drills are used in sinking.

#### Clear Creek County.

(From Our Special Correspondent.)

Fairmount.—An injunction has been issued by Judge De France preventing the owners of this claim from drifting into the property of J. H. Shepherd and extracting ore. The chute is the same as was worked by the Shafter people.

John Owen Mining and Milling Company.—The Freighters' Friend, Amy C. and Washington claims on Seaton Mountain have been bought by this company for $75,000. Boston capital is back of the undertaking and the management has contracted for a hoisting plant and air compressor. It is proposed to sink the shaft on the Freighters' Friend. The Amy C. has a shaft down 315 ft., with over 1,000 ft. of levels, and the Freighter's Friend has a shaft 200 ft. deep. The vein is the same as the Dove's Nest and Main Trunk which has produced thousands of tons of ore running $300 per ton. The Main Trunk has 2 ft. of $100 ore near the Amy C. lines. It is also showing milling ore of the same size.

#### Gilpin County.

(From Our Special Correspondent.)

November Ore Shipments. — There were shipped from Gilpin County to outside smelters 289 cars of ore, a tonnage of 5,347 tons, representing the smelting product and the shipments of mill tailings and concentrates.

Mining Deeds and Transfers.—C. S. Ripley to M. Stedman, the Charlemagne lode. H. E. Carus to W. R. Buck, ½ Bertha lode. F. W. Isham to Grouse Roost Gold Mining Company, the Katie V., Lillie Ruth, Wm. Dewey, Tiny Ruth and Vanell lodes. Annie Lower to H. M. Teller, 1/16 interest in Ethan Allen lode. J. V. Kriley to W. D. Nash et al, the U. S. S. Illinois, and 6 other lodes. J. Gilbertson to W. E. Garver, 1/6 interest in Lucille, Mint and Red Chief lodes. L. S. Newell, Jr., et al, to W. R. Rust, the Mountain City lode. W. J. Gilchrist to W. Roderick, ½ interest Smuggler lode. B. R. Hall to

F. W. Collins, the Etta, Maggie and Chaffee lodes. T. Kennedy to Nannie Ward the Lalla Rookh lode.

Receipts of Machinery.—The following machinery has been received recently: Four air drill compressors, one 100 and one 60 H. P. boilers for Topeka Mine, one 100 H. P. boiler and pump for Notaway Gold and Copper Mining Company, one 60 H. P. hoister for Banta Hill Consolidated Mines Company, one 100 H. P. boiler for Boston & Denver Mining and Milling Company, 2 cars of machinery for Gold Coin Mines Company. Most of the machinery is being furnished through the Hendrie & Bolthoff Manufacturing and Supply Company of Denver.

Gunnell Mining and Milling Company.—The November clean-up of mill dirt was 3 gold retorts weighing 675 oz. valued at $11,100, which, together with values from the mill tailings and the smelting ore make a nice product. F. C. Young, Central City, is manager.

Topeka.—A good strike has been made in connecting the east and west shafts at a depth of 400 ft., the vein averaging 5 ft., with a free gold streak from 4 to 8 in. wide. The best ore is being sacked and will be treated at Burlingame's office in Denver. The ore next the free gold streak, showing zinc blend lead and copper, assays over $1,000 per ton. The erection of buildings and the installation of machinery, is well under way. R. E. L. Townsend, Russell Gulch, is manager.

Lake County—Leadville.

(From Our Special Correspondent.)

California Gulch Mining Company.—The recently incorporated company, with 500,000 shares of stock at $1 a share, has a 10-years lease on 22 acres of ground embracing the Thompson and Gaw placers on both sides of California Gulch. It adjoins the properties of the Home Mining Company on the southwest.

Greenback.—This property from its new deep shaft, which has opened up the old Mahala ore shoot, is producing 125 tons per day of clean iron sulphides. Occasional streaks of copper sulphides and bunches of lead are also encountered.

Sixth Street.—This property, owned by the Leadville Mining, Drainage and Tunneling Company, is to be worked. The property has not been operated, except through the Coronado drift, since 1896, when the company was shipping 100 tons per day of good iron ore. Hundreds of thousands of dollars have been expended in handling the water.

Tarshish Mining, Milling & Leasing Company.—This new proposition is headed by a number of leading business men, including W. H. Beman, C. Hayden, A. Harvey, W. A. Young, Thos. Robson, F. K. Porter and others who have leased the 8 acres known as the "Seneca Reserve," a part of the old Seneca ground, and begun work on a new shaft northwest of the old Discovery shaft. The contract calls for a depth of 700 ft.

Weldon Mining Company.—Work at the 475 ft. of Weldon No. 1 continues and shipments are regular. At No. 2 shaft a big force is drifting and developing. Below these two shafts, the Nubian Company, under the same management as the Weldon, is sinking its new shaft to the ore.

Mineral County.

Nelson Tunnel.—This tunnel at Creede has over 800 ft. to go to strike the ground of the United Mines Company.

Ouray County.

(From Our Special Correspondent.)

Three feet of snow on the level, which fell December 12th and 13th, has blocked the roads and trails in all directions. Shipments will materially decrease in consequence during December. Large forces of men with teams are busy and expect to have the roads open soon.

A company of Denver capitalists are preparing to connect Ouray with the railroad at Ironton by an electric railway. A pipe line is being laid from Bear Creek Falls, a distance of 3 miles, to Ouray. The road will help open much mineral land between Ouray and Red Mountain, the ores from which cannot now be sold with profit. Electric power will also be supplied to mines throughout the county.

American-Nettie.—This property has been leased to several local parties at 50% royalty, the lease taking effect January 1st.

Beaver & Belfast.—Du Peau, et al., have given up their lease on these claims at Ironton, and several parties are looking over the ground with the intention of erecting a mill. These properties are on the same vein and show 4 ft. of lead ore carrying over 25% zinc. They have been intermittently worked without success for the past 15 years.

Caroline Mining Company.—Shipments have been interrupted owing to heavy snows, but will be resumed by mule train as soon as possible. The Revenue employs 600 men, and the force at the Virginius has been increased to 100.

Neodosha.—This property near the Wedge, north of Ouray and owned by the Caroline Company, is working under lease to Geo. Scandrett with 20 men, the output of first class ore being about 7 tons daily.

Silver Link.—This property, after 7 years' idleness, is being worked by its owners with a large force, and shipments continue regular.

Pitkin County.

(From Our Special Correspondent.)

Santiago Group.—This old property is to be developed again, Thos. M. Fulton having sold a block of stock to a Denver company for $500.

Sarah Bernhardt.—One-half interest in this group was sold December 10th to S. L. Rainey and J. I. Mathews of Denver for $950 cash. The property is an old producer and is situated 9 miles from Pitkin.

81 Group.—The claims are being developed by a tunnel now in 75 ft., in the breast of which is a small vein of good gold ore between porphyry walls. A 40 ft. shaft is developing a 9 in. streak of gold and silver ore.

Teller County—Cripple Creek.

(From Our Special Correspondent.)

November Output.—The output for November was 37,592 tons of ore of the total value of $1,592,288. Of this, 15,680 tons of the value of about $70 per ton, making $1,097,600, were sent to the smelters, and 20,612 tons of the value of $24 per ton, making $494,688, were handled by the chemical mills. The main bulk of the smelting ore probably did not run quite up to $70 per ton, but the rich shipment from the Isabella which ran over $3,000 per ton, brought the average up. The November tonnage was the largest ever sent out in any one month. The smelting ore being far beyond the amount usually shipped, more milling ore would have been handled had the milling capacity been greater. Only one local mill created any ore.

Jack Pot Mining Company.—The directors have declared a dividend of 6c. per share, making $75,000, derived from royalties received from lessees. There will still be in the treasury a surplus of about $37,000; also some money coming from ore not yet settled for.

John A. Logan.—A rich strike is reported on the 1,200-ft. level of this mine on Bull Hill, belonging to W. S. Stratton of the Independence, and a large amount of development has been done. The strike has not been verified, though it comes from a reliable source.

Lexington Gold Mining Company.—At the annual meeting the following officers were elected: J. S. Jones, president, C. G. Butler, vice-president, and N. H. Partridge, secretary and treasurer. These, with W. B. Storer and E. C. Fletcher, form the directory. The gross production of the company's property for the year ending December 1st, '99, was $54,342. The net production after deducting the cost of treatment and transportation was $38,426. The company owns property on Gold Hill and is in very good shape.

Independence Town and Mining Company.—Considerable ore is shipped. The company owns the Hull City Placer, which has made a wonderful record as a producer. W. S. Montgomery of Colorado Springs is the president and general manager.

Work Mining and Milling Company.—The big shaft on the Woods-Russell lease is on the Morning Glory claim of this company. Power drills have been recently put in and the shaft is approaching the depth of 200 ft. This shaft is being sunk for the extension of the rich Jack Pot vein.

IDAHO.

Boise County.

Idaho Consolidated Mining Company.—Lindley Murray, manager of this company, has, it is reported, secured an option on the option held by R. J. Anderson on the Checkmate Mine at Pearl. New York men are interested in the Idaho Company.

Elmore County.

Volcano District.—An important strike of copper, silver and gold ore is reported on Camas Prairie, 30 miles from Glenns Ferry. The ledge has been cut 6 ft., without any sign of the hanging, it is stated. The property is owned by J. H. Hawley and W. H. Puckett, of Boise; J. C. Rich and William Clemens, of Montpelier, and Mr. Dougherty, of Blackfoot.

Idaho County.

Iola.—This mine, at Warren, has closed its mill for the winter. Development work continues under Superintendent J. A. Wood. A shaft is being sunk from the adit level.

Newsome-Leggett Placer Mining Company.—C. H. Harding of Newsome is interested in organizing this company, which proposes to work some 500 acres of ground on Newsome and Leggett creeks. Tailings will be taken by a 600-ft. tunnel from Clearwater River.

Owyhee County.

De Lamar Mining Company, Limited.—The mill record for October is as follows: Gold produced, 2,190 oz.; silver, 8,614 oz.; total returns, $50,282; total expenditures, $37,625; net profit, $10,157.

Shoshone County.

Mining Conditions.—Now that federal troops have been withdrawn and the Coeur d'Alene are in a more prosperous condition than for years, it is interesting to note that wages have not fallen. Miners get $3.50 per day of 10 hours; shaft men, $4 a day of 8 hours; engineers, $4; surface laborers, $3; board, $1 a day; $1 a month hospital fees deducted from each man's wages.

Good discoveries of lignite are reported along Oro Fino Creek, 14 miles above Oro Fino. It is stated to show but 3% ash with 36% carbon and 61% volatile matter. J. W. Arthur of Spokane is interested.

Father Lode.—The 4-drill compressor plant at this mine on Sunset Peak near Wallace is about completed and will probably be running early in January. It is at the mouth of the lower tunnel. About 30 men are at work.

Sunset.—The long tunnel to transfer ore from Golden Chest.—A New York company is being formed to take over this and a number of adjacent properties near Murray. A cyanide plant is spoken of in case the deal goes through. The most important of the mines are those owned by the Dora and Katie Burnet Consolidated Mining Company. That company has been running the upper Chest mill for a long time. C. W. Beale, one of the owners, has been East arranging things.

this mine to the Nine-Mile side of Sunset Peak is being pushed ahead rapidly. It will be 2,000 ft. long.

Washington County.

Peacock.—This group, near Cuprum, in the Seven Devils District, is reported bonded by Kleinschmidt Brothers, of Butte, Mont., to the Boston & Idaho Mining Company, represented by C. W. Whitcomb, for a large sum.

MICHIGAN.

Copper.

Calumet & Hecla.—The company recently bought 75 acres of land in Red Jacket for $60,000, from A. S. Hulbert. The Calumet & Hecla Company is stated to be steadily buying all the land in sight about Calumet and even over toward Traverse Bay.

Trimountain.—At this mine surface improvements continue. A blacksmith shop and a well equipped machine shop are in use.

Iron—Menominee Range.

Crystal Falls Ore Output.—The output of the mines about Crystal for 1899 is estimated as follows: Crystal Falls, 146,000; Columbia, 125,000; Mansfield, 82,000; Bristol, 80,000; Lamont, 67,000; Great Western, 43,000; Lincoln, 43,000; Dunn (estimated), 14,000; total, 600,000 tons. The output in 1898 was about 260,000 tons. The output of the Hemlock Mine in Amasa this year is put at 110,000 tons.

Chicagon.—Test pits on this property near Iron River have shown up some good ore. Foundations are ready for the engine and boiler house. A diamond drill will explore the deposits.

Hilltop.—At this exploration near Crystal Falls, now owned by the American Mining Company, a diamond drill hole, it is reported, has shown 150 ft. of ore, after passing through 100 ft. of rock. The hole was driven east at an angle of 65°. Analyses showed 64% iron.

Tobin.—Corrigan, McKinney & Company of Cleveland, O., have taken a lease on this property near the Columbia at Crystal Falls.

MINNESOTA.

(From Our Special Correspondent.)

The Duluth, Missabe & Northern road has begun work on a third great ore dock at Duluth. The dock will be 1,200 ft. long, with a height to the deck of about 65 ft., 5 ft. more than its present highest dock. It will have about a mile of frontage, with 192 pockets, and will give the company a storage capacity for about 165,000 tons and a seasonal shipping capacity of about 5,000,000 tons.

The Duluth & Iron Range and the Eastern Minnesota have been trying the new style 50-ton cars. There will be 750 of these cars in use on these 2 roads next year.

The first loss of tonnage the Bessemer (Rockefeller) Steamship Company has met since its formation was the 3,000 ton steel barge No. 115 reported lost last week. It is one of the 30 ships bought a few weeks ago from the American Steel Barge Company.

Iron—Mesabi Range.

(From Our Special Correspondent.)

Elba.—This mine of the Minnesota Iron Company has probably its water under control, and will be a considerable shipper next year. The mine is pumping some 3,500 gals. a minute now. A. P. Silliman returns to this range to become mining engineer here and at Genoa.

Fayal Iron Company.—This company has begun stockpiling at 3 shafts and is extending its stripping at No. 3 shaft. The mine is opened ahead, under Capt. Wallace, and can produce an enormous tonnage for years. In its No. 1 territory there are some 17 miles of tracks underground. Last June work was undertaken at No. 3 shaft, with a shovel in the stripping,

and a body of ore has been stripped from which over 500,000 tons were shoveled and milled to the close of navigation. Fayal is probably the greatest iron mine in the world, of its character.

Thomas Explorations.—John M. Thomas, of the Duluth Furnace Company, begins explorations on a 40 acre tract adjoining the Alpena and Sauntry Mines, where ore has been shown.

Iron—Vermilion Range.

(From Our Special Correspondent.)

Explorations are to begin at once on 400 acres on the shores of a lake directly west of Eagle's Nest, in sections 28 and 32, T. 62, R. 14. The property is under option to an Eastern syndicate for $225,000. Surface indications are excellent, but no work has yet been done. The Duluth & Iron Range road passes close to it.

The Mahoning Ore and Steel Company has drills at work on the Roy property close to Tower. Cole & McDonald, who are doing the work, have a contract with the same company for drilling in section 16, T. 62 R. 14, east of Tower.

The Minnesota Iron Company is stocking ore rapidly at its Soudan mines and expects to have 300,000 tons on surface by spring. During the closing year a vast amount of underground diamond drill work has been done. Tower Hill has been pretty thoroughly explored.

## MISSOURI.

### Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The week just closed has apparently borne out the assertions of ore buyers that the quoted price of spelter has little to do with the price of ore, for top grade zinc ore advanced $2 to $36. The Eagle ore sold at this price and 1 or 2 more lots brought the same figure. Lead sold all the week at $27 per 1,000 lbs. until the last of the week, when Joplin lead brought $27.50 per 1,000 lbs. delivered.

The first heavy snow of the season has fallen, greatly curtailing the output of the hand jig plants, and this may partly account for the advance in prices for fancy grade zinc ore.

Last year at this time top grade zinc ore was selling at $35 per ton, but this year the sales were in excess of those of last year by 1,324,240 lbs. of zinc and 168,420 lbs. of lead, and the value was greater by $33,160; while for the corresponding 50 weeks of last year, although the lead sales were greater by 3,078,522 lbs., the zinc sales were less by 61,969,570 lbs. and the value was less by $3,844,601.

As compared with the preceding week, the sales show a decrease of 3,275,870 lbs. of zinc and 236,480 lbs. of lead, and in value of $42,689. Following is the turn-in by camps:

| | Zinc lbs. | Lead lbs. | Value. |
|---|---|---|---|
| Joplin | 1,963,360 | 221,660 | $44,108 |
| Carterville | 985,360 | 265,710 | 23,743 |
| Webb City | 646,440 | 36,700 | 11,666 |
| Oronogo | 760,600 | ..... | 15,993 |
| Belleville | 281,130 | 6,110 | 4,989 |
| Cave Springs | 35,000 | ..... | 560 |
| Duenweg | 118,200 | 7,460 | 1,983 |
| Central City | 142,110 | 11,630 | 2,594 |
| South Jackson | 40,450 | 34,300 | 1,572 |
| Stotts City | 239,090 | ..... | 3,945 |
| Granby | 372,000 | 36,520 | 5,526 |
| Neck City | 137,170 | ..... | 2,395 |
| Aurora | 1,214,000 | 33,500 | 17,285 |
| Galena-Empire | 2,043,890 | 224,000 | 37,851 |
| Lehigh | 39,940 | ..... | 689 |
| District total | 8,019,740 | 877,990 | $174,899 |
| Total 50 weeks | 492,554,720 | 46,492,840 | $10,498,220 |

Mining Land Sales.—Col. Tom Carpenter, Ben Carney and Tom Cole have sold their property on the land of the Galena Lead and Zinc Company at Galena to Carney, Hoffner & Company for $15,000. The Boqua Mine, recently bought by Grounds and Miller, will hereafter be known as the Cork Leg, and C. R. Booker will be superintendent. A transfer of the Rabbit's Foot Mine and the Joiner lease of 40 acres 4 miles west of Joplin has been made, the consideration being $25,000. The sale of the Monarch Mine west of Joplin is being negotiated for $5,070. A new mill started on this property last Monday. Minnesota parties have bought the Blue Bell Mine and Mill on the Missouri Zinc Fields ground at Carterville of O'Neal & McDermott for $20,000. The Redding Mine and 40 acre fee on Shoal Creek, southeast of Joplin, has been sold to C. H. Silliman of Fort Worth, Tex., for $50,000. The deal was made by S. M. Smith of the Joplin Mining Exchange. The Aida Mine at Galena was sold last week to a Boston syndicate for $50,000. The deal was engineered by Dr. R. A. and Claude Thornton of Joplin.

## MONTANA.

### Beaverhead County.

Coast Gold Mining Company.—It is stated that this Philadelphia, Pa., company will spend nearly $200,000 in developing its ground on Grasshopper Creek, next year. The work will include the coustruction of new dredges. The present dredger is 102 ft. long, 32 ft. wide, and has 7 ft. depth of hull. The company's ground is reported to go 15c. per yard and over. E. L. Hall is manager.

### Cascade County.

Florence.—This silver mine, at Neihart, which is having some controversy with its neighbor, the Preston, regarding apex rights, declared a 5c. dividend December 1st.

### Deer Lodge County.

Ophir.—This mine, an extension of the once famous Gloster, at Gloster, was recently sold to John Larson, of Marysville, for $2,500.

### Flathead County.

Fisher Creek.—This Cleveland, O., concern is developing a promising group of claims adjoining the Bell on Fisher Creek. Material for a saw mill and a 10-stamp mill are at Libby and will be brought in as soon as the snow is deep enough.

Libby Creek Mining Company.—This company is working the Shaughnessy Hill mines, located about 8 miles south of Libby in the Cabinet Mountains. It has a concentrator there of 150 tons capacity and employs from 50 to 75 men. The concentrator was built this season.

Silver Cable.—This mine, owned by Hart & Hackett, about 23 miles south of Libby, is closed for the winter, but the owners expect to open up in the spring. There is a concentrator on the property.

Snowshoe.—At this mine at Libby the main tunnel is now in 1,900 ft. and will be continued through the mountain, a total distance of 3,500 ft. The mine is equipped with air drills and an electric light plant.

### Lewis & Clarke County.

Montana Mining Company.—The manager at Marysville reports a vein 4 to 5 ft. wide, carrying $8 to $10 gold per ton cut at the 400 and 700-ft. levels. The estimated value of the product for October was 2,810 oz. gold and 10,070 oz. silver from 4,000 tons of ore and 12,257 tons of tailings. The return from the ore was $23,800 and from the tailings, $38,100; the cost of treating the tailings was but $4,290. The total cost of treating the 12,257 tons of tailings was but $4,290, a remarkable showing. The total expenses were $49,200, leaving an estimated net profit of $12,700.

### Silver Bow County.

Anaconda Copper Company.—At the upper works at Anaconda the Bruckner roasting furnaces are revolving steadily, with only 1 or 2 out of the 40 undergoing any repairs. The 4 2-story Wethey furnaces are also in regular operation with the usual good results, says the Anaconda "Standard." In the matte department the old matte furnaces are nearly gone and 9 new furnaces built, leaving but 2 of the old furnaces standing. The old ones have a floor length of 20 ft. 6 in., while the length of the new one is 29 ft. 6 in.

Two 6-ft. Griffin mills, made by the Bradley Pulverizer Company, have been set up in the eastern section. These mills are to regrind tailings from the upper jigs, passing them on to the lower ones, of which there are 9 sets. The mills have a capacity each of from 50 to 100 tons per 24 hours. Preparations are being made for 2 more similar mills in the western section of the concentrator.

## NEVADA.

### Churchill County.

National Nickel Mining Company.—The mining property of this company at Cottonwood Canyon has been sold by United States Marshal J. F. Emmitt to the Nevada Nickel Company, Limited, for $38,071, subject to confirmation by the United States Circuit court and subject to redemption.

### Elko County.

(From Our Special Correspondent.)

Dexter.—It is said that the output for November was $21,000. Mr. S. B. Milner has resigned as manager and is succeeded by Mr. R. G. Legg, who it is believed will prove the right man in the right place.

Young American Company.—This company, at Tuscarora, has a pump and a gasoline hoist installed, and is erecting a 10-stamp mill.

### Humboldt County.

(From Our Special Correspondent.)

Glasgow & Western.—Two reverberatories were fired December 12th for a trial test on outside gold and silver ores mixed with Adelaide copper products. It is the intent to start the mill and smelter for a continuous campaign in about 6 weeks. Meantime some Huntingtons and Wilfleys are to be installed at the concentrating mill. Annoying delays are met in getting machinery and supplies. At the Adelaide Mine, 12 miles south of Golconda, connected by a narrow gauge railroad with the smelter, a station is being cut for 300 ft. level and drifting for the main pyritic copper ore body is soon to start. Both oxidized and pyritic ore bodies show finely. A 6-drill compressor has been set up. A. P. Stanley Macquisten, managing director, and General Manager Stalmann were at Golconda last week.

### Lincoln County.

(From Our Special Correspondent.)

De La Mar.—General Manager Hartwig A. Cohen and T. H. Oxnam, former superintendent but now Pacific Coast manager of Captain De La Mar's interests, visited the property last week. While in consultation with Superintendent Swindler several improvements were determined on. The petition of the men in the crushing department to have an 8-hour shift was granted by Mr. Cohen, owing to the danger of inhaling dust. Output of the mines is steadily maintained at 9,000 tons of ore per month, and values show no falling away.

## NEW YORK.

### Ulster County.

New York & Rosendale Cement Company.—A bad slide of rock down the mountain side at Rosendale carried off a number of buildings with boilers, engines, etc., belonging to this company, and did considerable damage to the cement mine on December 26th.

## NORTH CAROLINA.

### Burke County.

(From Our Special Correspondent.)

Etley.—This gold property near Johns River has been sold for $2,300. It is a good prospect. Mrs. S. A. McDowell has sold the mineral interest on her farm for $5,500.

### Cleveland County.

(From Our Special Correspondent.)

Monazite Shipments.—Four carloads of monazite were shipped in November by L. A. Gettys of Cleveland Station to his firm at Gloucester, N. J.

### Johnston County.

(From Our Special Correspondent.)

Iron ore has been discovered on G. W. Wilson's farm. One car-load has been shipped to the Empire Steel and Iron Company's furnace at Greensboro. It ran from 45 to 55% iron. Mr. Pickett, president of the company, has offered to purchase. If development justifies, the Southern Railroad will build a side track 1½ miles from Wilson's mills to the mine.

### Rowan County.

(From Our Special Correspondent.)

Dutch Creek.—These copper and gold mines are at work. J. J. Newman is manager.

Gold Hill.—These mines to be reopened by Walter G. Newman of New York. Two 100-H. P. boilers and other machinery are being placed at the Randolph shaft. The shaft is 800 ft. deep and is reported to show up large reserves of low-grade gold-copper ore.

## PENNSYLVANIA.

### Anthracite Coal.

According to Inspector H. Davies, of the Fifth, or Hazleton, District, the accidents in the district for the year ending December 1st, 1899, were 42 fatal and 87 non-fatal.

Inspector Maguire, of the Eighth District, reports 35 fatal and 79 non-fatal accidents for the year.

Ward Brennan, inspector of the Seventh, or Shamokin, District, in his annual report says that during the past year there were 54 fatal and 84 non-fatal accidents, the deaths leaving 32 widows and 79 orphans. Forty-two colleries and 2 washeries are in operation, and the total shipments will run up to 6,000,000 tons, a large increase over 1897. The number of men employed was 21,056, against 19,557 in the previous year.

### Bituminous Coal.

Fred D. Barker and John A. Scott, representing the Lackawanna Iron and Steel Company, have filed 60 deeds in Indiana County, covering the purchase of 10,000 acres of coal in Buffington and East Wheatfield townships. The consideration was $180,000.

H. C. Frick Coke Company.—This company, on account of the success of the compressed air haulage at its Leisenring No. 1 plant, has installed also a compressor and air locomotive in the United Mine, in the north end of the region. The work is not completed there yet. It is also the company's intention to put in compressed air haulage at the Leisenring No. 3 plant.

Morrisdale Coal Company.—The boiler, engine and compressor houses of this company, at Morrisdale, with the machinery, were destroyed by fire December 15th. The loss is estimated at $30,000.

## SOUTH DAKOTA.

### Custer County.

(From Our Special Correspondent.)

Akron Milling, Mining and Manufacturing Company.—This company has its factory in Custer grinding up the ochre, mica and graphite from the mines there. Test runs have been made on many kinds of ores. The capacity is about 2 tons per hour. The ore passes through a Raymond mill furnished by the Raymond Brothers Pulverizer Company of Chicago, and is separated by a Raymond vacuum separator. A complete system of drying and roasting kilns has been built. The product will be shipped to the company's paint and axle grease factory at Aurora, Ill.

Duchess.—Work has been resumed in this claim, southwest of Custer. The company proposes to put in a steam plant in the spring. J. F. Siden is superintendent.

Lawrence County.

(From Our Special Correspondent.)

Cyaniding the Cement Ores.—Successful experiments have been made on the cement ores of the Blacktail Mining District, 3 miles west of Deadwood. R. M. Maloney, of Deadwood, has been working a shoot of ore in the old Deadbroke Mine. The ore is stamped and then cyanided. It requires a week to 10 days. B. C. Cook and P. L. Gibbs, of Deadwood, have made similar tests on ore from the Omega Mine, located at Terraville, using the old Hildebrand stamp mill. W. D. Parker, of Deadwood, is chemist at the Cook plant, and O. N. Brown at the Deadbroke Mine. Messrs. Cook & Gibbs contemplate a large plant on the present mill site next spring. In this district there are many beds of low grade cement ores. Slimes give trouble in the cyanide process. Seth Bullock has a cyanide plant at Central City, a short distance from the Cook plant. The chemist in charge is John M. Henton, formerly of Montana. The ore comes from the Jack Pot and Gunnison mines, in the Bald Mountain District. Two more tanks are being put in. The old Esmeralda Mine is owned by E. Faust & Son, of Lead and Central City. The Huntington mill is crushing on a rich shoot of cement ore. Tanks for a cyanide annex are ordered.

TENNESSEE.

Polk County.

Ducktown Sulphur, Copper and Iron Company.—This company is working its mines at Ducktown with a reduced force of miners, non-union men.

Tennesse Copper Company.—The company has voluntarily granted its employees at Ducktown an 8-hour shift and has increased underground miners' wages to $1.50 and $2 per day, while surface hands receive an increase of 10%.

UTAH.

(From Our Special Correspondent.)

Bullion and Ore Shipments.—During the week ending December 16th the several smelteries sent forward 21 cars, or 896,025 lbs., lead-silver bullion; 5 cars, or 261,819 lbs. copper bullion. In the same week there were shipped from the different camps 63 cars, or 2,580,180 lbs., of ore to smelteries outside of the state for treatment.

Proposed Custom Smelter.—R. C. Chambers of the Ontario has had estimates made for a model plant and behind the move are prominent ore producers of Park City and others. Construction will not be begun during the winter.

Iron County.

(From Our Special Correspondent.)

A New Gold District.—D. J. Huntsman, a prospector, has discovered a new gold district 12 miles east of Stateline. He says one ledge is 30 ft. wide and a 1½-ft. seam of this rock carries much gold and silver. The ground is owned by W. H. Child and W. H. Tibbas and Mr. Huntsman, and the find has caused quite a stir.

Milner-Dear Groups.—Colonel S. B. Milner of Salt Lake and R. B. Dear of Duluth, Minn, are associated in groups of iron claims and are adding to their holdings. Frederick Lerch, formerly on the Messabi Range, Minn., is to open up the claims. An average of 54 analyses shows 62% iron without a trace of sulphur.

Page Groups.—It is said the Colorado Fuel and Iron Company has purchased the iron claims owned by Page Brothers.

Juab County.

Centennial-Eureka.—At a meeting of the directors in Boston on December 18th, A. F. Holden was elected president to succeed C. A. Hight, Mr. Hight remains a director. Chas. H. Cole, Jr., is succeeded as treasurer by Mr. F. W. Bachelder, and E. A. Clark is succeeded as director by B. W. Palmer. A full list of the directors is: A. F. Holden, B. W. Palmer, C. A. Hight, W. H. Coolidge, Joseph S. Ricker.

(From Our Special Correspondent.)

Tintic Shipments.—In the week ending December 16th there were sent out from the 3 railroad points of the district 2 bars bullion, 87 cars of ore and 3 cars of concentrates, credited as follows: Centennial-Eureka, 16 cars ore; Gemini, 12 cars; Grand Central, 12 cars; Swansea, 12 cars; Mammoth, 8 cars ore, 2 bars bullion, 1 car concentrates; South Swansea, 3 cars ore; Godiva, 2 cars; Humbug and Uncle Sam, 2 cars; Bullion-Beck, 2 cars concentrates; Ajax, Boss Tweed, Sunbeam and Tesora, each 1 car ore. Tintic Iron, 16 cars hematite for flux.

Centennial-Eureka—When these shares reached $23.50 buying orders began to go to Boston, and on December 16th, after the break below $20, orders were wired for over 5,000 shares. Several of the old stockholders are buyers, and it is said that more than 15,000 shares are now owned in Salt Lake, and more are being purchased. The mines cost $2,100,000, beside commissions, expenditures for examination and reorganization, etc.—probably all told $2,350,000—and on December 16th shares sold at a rate of less than $2,000,000 for the property. It is stated that the mines are intrinsically worth more now than when the Bostonians purchased them. There is much speculation as to what will occur relative to control and management of the United States Mining Company, but locally the importance of Centennial-Eureka eclipses all other happenings on the Boston market.

Joe Bowers.—A stock dividend of 48 shares for each 1,000 shares will be paid on December 20th.

Joe Bowers Extension.—On December 15th an assessment of 1c. per share was levied, which will supply $4,500 to continue development.

Midnight Bowers.—On December 15th at the annual meeting the following directors were chosen: A. Hanauer, L. S. Farnsworth, A. C. Ellis, W. P. Lynn and W. F. Smith.

Star Consolidated.—On the voluntary assessment nearly $14,000 was paid in by December 16th. Exploration is to be under E. P. Jennings, superintendent.

Tesora.—A car of ore settled for on December 16th carried 9% copper, 19 oz. silver and $1.50 gold per ton, with an excess of 18% iron. It was from the 250 ft. level. Two cars are at sampler from the gold shoot. Management counts on sending out 2 cars a week.

Salt Lake County.

(From Our Special Correspondent.)

Agnes & Dana.—A tunnel is started to cut Dana ledge 500 ft. under old workings. This property has been neglected for several years. I. S. Pine and other New Englanders are interested.

Bingham Copper and Gold.—Main crosscut tunnel has not cut ledge. Rock in face is softer. This development is watched with interest.

Louise S.—Willard F. Snyder, who is to be manager, proposes to connect the lower tunnel in 500 ft. with the bottom of shaft and then connect shaft with upper tunnel, which will give good air beside opening ore. This ground is directly south of Silver Shield.

Petro.—A drift from old workings is being run jointly with York that will cut dividing line in about 600 ft., where it will be over 800 ft. below top of ledge. Little is heard of the large ore reserves of a few months ago.

United States.—General Superintendent Neill's report for November shows 2,161 ft. of development accomplished; 1,256 ft. in Old Jordan, 695 ft. in Old Telegraph, and 210 ft. in Niagara territory, and the larger portion was in ore. The new 30-drill compressor will soon be in commission. Over a mile of pipe is in place. All surface improvements were completed before winter set in. General Superintendent Neill has just placed an order for a 20-drill compressor with the Edward P. Allis Company of Milwaukee, Wis. About 140 men will be kept on exploration during the winter.

York.—A tunnel to tap the vein west of old workings is being driven. Superintendent Grow believes he has traced the vein.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—In the week of December 16th there were marketed through the Mackintosh Sampler 1,884,660 lbs. of smelter products, and in addition 728,970 lbs. of Daly West crude were sampled at the Valley samplers, making a total of 2,613,630 lbs., made up as follows: Daly West, crude, 1,083,960 lbs.; Silver King, crude, 702,470 lbs., concentrates, 354,420 lbs.; Ontario, crude, 225,830 lbs.; Anchor, concentrates, 207,570 lbs.; Wykoff, concentrates, 39,380 lbs.

Creole.—It turns out that the reported sale of Creole holdings to Silver King lacks foundation. At the recent stockholders' meeting, E. W. Berry, Mrs. D. F. Condon, Thomas Cupit, James L. Berry, of Park City, and David Spitz of Salt Lake, were chosen directors. Development is on again, E. W. Berry, the new president, furnishing the means.

Daly-West.—Deed of the 15 claims of the Morgan Mining Company was filed for record at Coalville this week; consideration $100,000. Ore shipments under the new schedule of sampling alternate between the Mackintosh, Tayor & Brunton and Conklin samplers.

East Ontario.—The lower level on the tunnel vein shows flattering ore uncoverings at a depth of 1,200 ft. Marcus Barnes is superintendent.

Quincy Mining Company.—Incorporation articles show capitalization of $112,000 in shares of 75c. each. Officers and directors are: D. C. McLaughlin, president; James Farrell, vice president; W. W. Armstrong, treasurer; Walter Scott, secretary; William M. Ferry and Francis Smith. The company holds the Putnam group on which there is a $50,000 bond. A 500 ft. shaft is being sunk in anticipation of cutting the contact before that depth is attained.

Uinta County.

(From Our Special Correspondent.)

Dyer.—Coke is being hauled from Carter, and Manager George A. Londsberry states that everything is in readiness to make copper. Owing to the difficulty o getting coke during the winter, this first run will not be a test of how the ore will work. From all accounts the mine is in splendid form.

Hardy Group.—John Glenn, United States deputy surveyor, is to survey the group of claims owned by J. H. Hardy, on south slope of Dyer Hill, for patent.

Leiter's Asphaltum Deal Off.—J. W. McCaslin, who bonded 27 claims to Joseph Leiter, reports that the deal is off. When the Uncompahgre reservation was thrown open the Government reserved the asphaltum lands, but prior thereto these claims were filed upon and Mr. McCaslin maintains that the courts will protect his title.

WASHINGTON.

Kititias County.

Snohomish County.

(From Our Special Correspondent.)

Bonanza Queen.—Messrs. Metcalf, Sweet & Galliger, of Butte, Mont., have secured a working bond on this group at Silverton, and are working 20 to 25 men. The Bonanza Queen and Copper King are the principal claims and are on one vein, the other claims covering cross leads. Development work under the bond is confined principally to these two. The principal value is in copper, although in some of the cross leads gold predominates. Black oxide of copper and chalcopyrite have been exposed in a crosscut from the tunnel on the Bonanza Queen. The only obstacle that has blocked several prospective sales in the last 5 years has been the price and terms asked by the original locators, Messrs. Bender, Southerland and Lockwood. The consideration under the present bond is $150,000.

## FOREIGN MINING NEWS.

ASIA.

India—Deccan.

Wondalli Gold Mines.—This company now has its mines and mill in operation, and reports for November 1,085 tons ore crushed. The yield was 645 oz. gold, and 24 tons concentrates were saved, assaying 1.45 oz. to the ton. The average mill recovery was 0.59 oz. to the ton.

AUSTRALASIA.

New South Wales.

Broken Hill Proprietary Company.—This company reports for the four weeks ending December 6th, a total output from the refinery of 2,418 tons lead, 40 tons hard (antimonial) lead, 355,718 oz. silver and 2,226 oz. gold.

Queensland.

Mount Morgan Gold Mining Company.—This company reports for the month of November a total of 20,145 tons of ore crushed and treated by chlorination. The yield was 17,737 oz. gold, an average of 0.88 oz. to the ton. The usual dividend of 7d. per share was paid for the month.

CANADA.

British Columbia—Nelson.

Hall Mines, Limited.—This company makes the following statement for five weeks ending December 1st. The lead smelter was in blast 19 days 15 hours, treating 128 tons Silver King ore (containing approximately 1,540 oz. silver), and 388 tons purchased ores. The product was 105 tons lead bullion, containing approximately 102 tons lead, 11,330 oz. silver and 387 oz. gold. The average return was therefore 19.8% lead, 21.96 oz. silver and 0.75 oz. gold to the ton.

British Columbia—West Kootenay District.

(From Our Special Correspondent.)

Rossland Ore Shipments.—The output of Rossland mines for the 11 months and 14 days ending December 14th amounted to about 175,000 tons, valued at $3,000,000 gross.

Mine Owners' Protective Association.—This organization held its annual meeting at Rossland Saturday evening, December 8th, with closed doors. Rossland mines were represented by Major Collins of the British America Corporation, J. B. Hastings of the War Eagle, Alexander Diek of the Canadian B. C. Syndicate, W. Y. Williams of the Big Three, Loire Becker of the Deer Park; Nelson mines by H. E. Croasdale of the Hall mines, R. W. Brigstock of the Fern, J. J. Campbell of the Hall Mines Smelter; Slocan mines by J. Roderick Robertson of the London & British Columbia Gold Fields, T. J. Duncan of the Duncan mines; Boundary mines by T. Mayne Daly of the Brandon & Golden Crown, W. Y. Williams of the Old Ironside and Knob Hill mines and Granby Smelter, Frank Robbins of the Dominion Copper Company. The proceedings have not been published, but it is understood the labor troubles growing out of the 8-hour law were discussed.

Dundee.—As the details of the recent reorganization of this Ymir company are not complete, operations have not been resumed, thought a working capital of £50,000 has been provided.

Sunset No. 2.—At 100 ft. level in a crosscut 250 ft. from No. 3 shaft of this Rossland claim, a ledge of mixed ore 12 ft. wide has been cut. The values are in gold and copper. This discovery has been made on No. 3 vein. No 3 shaft is down 100 ft. and is more or less on the ledge. The ore is in bunches. The outcrop has been traced for 2,000 ft.

British Columbia—Yale District.

(From Our Special Correspondent.)

Heavy falls of snow have prevailed in the Boundary Country this week.

B. C.—This, the leading mine in Summit Camp, will be ready to ship 400 tons a day in a few months until the dump is exhausted. A 40-drill compressor to be installed. A. C. McArthur has secured the contract for the new ore bins. The first-class ore on the dump will average 20% copper, the lower grade ore 7%, it is said.

Boundary Creek Mining and Milling Company.—A carload of ore shipped to Trail brought $110 after deducting all charges. It carried 2.1 oz. gold, 131 oz. silver, 12% lead and 15% copper.

Earthquake.—Recent assays from face of drift at foot of winze are said to have given from $10.15 to $20 in gold and copper.

Yankee Boy.—The bond on this property will be taken up by Major Leckie, et al, at maturity Material for buildings was sent out on December 11th. Major Leckie states that the property bears every indication of becoming a big mine.

Nova Scotia—Guysboro County.

(From Our Special Correspondent.)

Blue Nose.—This mine at Goldenville returned from 1,275 tons of ore 409½ oz. for November. The mine is now 350 ft. deep, and the ore value has gradually increased.

Crow's Nest.—Returns are 55 oz. from 700 tons.

Richardson.—This mine at Isaac's Harbor keeps up its satisfactory output, the returns for October and November being 590 oz. from 3,900 tons of rock.

Ontario—Lake of the Woods District.

(From Our Special Correspondent.)

Mikado Gold Mining Company.—The November clean-up was nearly $18,500, including the results of the cyanide mill.

Sultana Mine of Canada.—The prospectus of the new company that has taken over John F. Caldwell's Sultana mine has been issued. The capital is £275,000, of which £50,000 is reserved for working capital. There had been treated at the time of the latest examination about 25,000 tons of rock that had yielded about $375,000, or $15 to the ton. The mine was 441 ft. deep and has a 30-stamp mill and chlorination plant. The present milling capacity is 2,000 tons per month, and the chlorination mill will care for 6 tons of concentrates every 24 hours. On November 30th 9 air drills were working in development underground and the mill was closed till it could be supplied with rock continuously. The mill is still closed.

CUBA.

Cuban Steel Ore Company.—It is announced that the company has bought 2,000 acres of iron ore land in Guama, 5 or 6 miles inland from Chiriviri, 20 miles west of Santiago. A railroad from the mines to Chirivini is under way. The Pennsylvania Steel Company has the contract for the bridges along the 10 miles of track and will also build a 1,000-ft. ore dock.

NEWFOUNDLAND.

Newfoundland Copper Company.—A report issued in London, covering the period of 18 months ending September 30th, 1899, states that a considerable amount of development work has been accomplished. The attention and energies of the management have been concentrated upon the Little Bay property, in which the Sleepy Hollow Mine is situated. This mine has been examined by three mining experts, all of whom report favorably on its prospects as a copper producer. The manager has shipped 1,170 tons of copper ore to Great Britain, which has been sold well, and there is now another shipment ready as soon as transport can be arranged.

SOUTH AMERICA.

British Guiana.

The gold production for the month of November, on which royalty was paid, is reported by the Mines Department at 8,123 oz., against 8,647 oz. in 1898; showing a decrease of 524 oz., or 6.1%, this year.

## COAL TRADE REVIEW.

**New York.** Dec. 22.

**Anthracite.**

The weather persistently refuses to send the mercury toward the zero mark. In consequence domestic consumption in all anthracite territory is much lighter than at this time last year, and the prospects begin to favor a milder winter. As yet, however, there is no let up in activity at the mines, many collieries making full time, and the miners will undoubtedly have the merriest Christmas in many years.

In the West there is a decidedly easier feeling. Stocks on hand at Duluth just about equal those at the close of navigation last year. As a milder winter is quite probable, the chances are that there is coal enough on dock to last till spring. In Chicago territory consumers are affected by the weather and are buying only in a hand-to-mouth sort of way. Prices, however, are firm and higher freight rates proposed by the railroads are likely to advance quotations in January, particularly if a cold wave should happen along.

The demand for steam sizes in the East continues very heavy, owing to the difficulty many consumers have in getting soft coal. Business activity that keeps mills humming, with a continued shortage in water supply for power, renders manufacturers glad to burn any fuel they can get. Of the prepared sizes, egg is now in best supply. Burners of soft coal keep broken size from accumulating and, with domestic demand centered on chestnut, egg is a trifle out of the running.

We continue to quote free burning anthracite f. o. b. New York: Broken, $3.50; egg, $3.90; stove, $4.15@$4.25; nut, $4.25. The prepared sizes are: Pea, $2.75@$3; buckwheat, $2@$2.50; rice, $1.45@$1.60.

**Bituminous.**

The chief difficulty that has confronted producers and consumers in the Atlantic seaboard soft coal trade during the week has been poor transportation from mines to tide by the railroads. The Pennsylvania has had some bad blockades and for one reason or another the other roads did not give good dispatch. This slow movement kept down deliveries and consumers are still clamoring for coal. Even the down East shoal water ports are not satisfied yet, and along the Sound the demand shows no falling off worth noticing. There are slight offerings of poorer grades of coal, but not enough to affect the situation materially. New York Harbor trade is as good as ever, and consumers insist on prompt deliveries. All rail business continues big.

There is very reason to believe that mining costs on all grades of coal will be higher next year than this, and the indications are that this advance may come by mutual agreements. In the George's Creek field, for instance, the miners who wish a 10c. per ton advance are trying to bring about a meeting between representatives of the miners and operators to talk over the outlook.

Transportation from mines to tide has been slow, and as a result car supply has not improved. It has been about 2/3 of the demand, not a bad showing considering the number of loaded cars strung along the tracks to tidewater. In the coastwise vessel market vessels are in good demand, and are also in better supply. Rates are fairly firm at $1.80@$1.95 from Philadelphia to Boston, and $1.40@$1.50 to Providence, New Bedford and the Sound. Rates from the further lower ports are about 25c. above these figures.

**Birmingham, Ala** Dec. 18.

(From Our Special Correspondent.)

The coal trade in Alabama continues very active and it is simply a matter of production now as to the amount of business that can be done. The mines of Alabama are in active operation, the inability of the railroads to supply the full demand for cars being the only interference offered the trade. There is a demand for more coal than is being produced. The local demand, the demand of the furnaces, mills and foundries and railroads at home, is enormous. There is a heavy demand for the product from adjoining States.

State Mine Inspector J. de B. Hooper on Saturday made an estimate of the production for this State for the year about to close. He says that the output should push the 7,500,000 mark. He makes his estimate on what figures there are at hand, the daily production in the district at present, and from indications. According to the figures of Dr. E. A. Smith, State Geologist, there was mined during the third quarter of the year 1,903,065 tons of coal. The estimates based on figures given out from his office put the output for the year 1899 at 7,281,364 tons. The figures of State Mine Inspector Hooper are believed to be the better of the two.

The new companies organized in this district for coal mining are getting ready to begin active operations at once. The Sobert-Donaldson Coal Company is the latest company to be organized and mines are now being opened at Nauvoo, on the line of the Northern Alabama Division of the Southern Railway in the northwestern part of the State.

W. H. Weller, of the Jenifer Furnace Company, during the past week concluded a deal for the purchase of 480 acres of coal lands in the vicinity of Blue Creek, where are located several mines belonging to the Tennessee Coal, Iron and Railroad Company. This property will be developed at once, and it is proposed to have an output something like 150 to 200 tons a day shortly after the new year sets in. The coke ovens near Connellsvills, a mile from the mines, have been leased and the coal from the new mines will be coked. The Jenifer Furnace will hardly be ready to go into blast until a couple of months yet, but it is likely that coal and coke manufactured in the Blue Creek region by this company will be put on the market, though this is not given out with any authenticity.

The miners, at their annual convention here this past week, elected the same president, George W. Young, of Blocton, and secretary, J. L. Clemo, of Adger, and a new executive board. The members of the board are conservative men and will hardly do anything that is rash or would injure conditions. A fight is on in this State between the United Mine Workers of America organization and the Knights of Labor, both of whom have large numbers of men at work in the mines, the latter more in Walker County than elsewhere.

**Chicago.** Dec. 19

(From Our Special Correspondent.)

Anthracite Coal.—Sales have diminished somewhat during the week, the warmer weather tending to make a quiet market and thereby give dealers a chance to replenish stocks to a small extent. Orders are mainly for car-load lots, with a few as high as five car-loads to both city and country trade. The shortage of hard coal hereabouts is very noticeable, agents still being unable to obtain cars. The price of hard coal is not likely to sag, but may go higher, now that Lake traffic is at an end, and the railroads are the only source of supply. The week's prices have been very firm, $5.75 being asked for egg and stove, and $6 for chestnut.

Bituminous coal continues in fair demand, while supply is rather larger. The demand for cars to haul coal is yet away beyond what the railroads can supply. Prospects look well for continued good trade and prices are not likely to change one way or the other.

Coke is in great demand, with no increase in supply. Prices are steady.

**Pittsburg.** Dec. 20.

(From Our Special Correspondent.)

There was considerable grumbling among local coal dealers over the advance in prices made by the two coal combinations last week. They are paying the new rate, but immediately increased the cost to the consumer. In the notice sent to the dealers it is stated that the rates are subject to change without notice and a further advance is expected. All the coal loaded in the pools and harbor of the Monongahela River did not get out on the rise last week. There is still about 10,000 bu. ready to go out. The rivers are rising, and it is likely there will be enough water to take out all the remaining coal this week. There was a heavier demand for coal at Cincinnati than was expected, and the proposed rate of 6c. a bu. was not made, the prices remaining at 8c. at Cincinnati, and 8½c. at Louisville. It is estimated that the Monongahela River Consolidated Coal and Coke Company made a profit of $500,000 on the shipment last week.

Connellsville Coke.—The car supply was better last week and the shipments exceeded all previous records. More ovens have been fired up, and it is believed that the production for the first week in the year will reach the 200,000-ton mark. The production last week was 196,838 tons. The shipments aggregated 11,274 cars, distributed as follows: To Pittsburg and river tipples, 3,184 cars; to points west of Pittsburg, 6,138 cars; to points east of Connellsville, 1,952 cars. This is an increase of 1,083 cars.

## SLATE TRADE REVIEW.

**New York.** Dec. 22.

Order books are being balanced for the year, and deliveries are limited to regular customers. More talk is heard of a new price list for roofing slate in January.

The exports from New York in November were valued at $60,154, as against $75,220 in the same month last year. The distribution in 1899 as collected by us is as follows: United Kingdom, $44,471; Australasia, $13,911; Denmark, $800; China, $105; Central America, the West Indies and Mexico, $843; South America, $14. The amount of roofing slate shipped was 10,100 squares, or 50 squares less than October, and about 5,000 squares less than November, 1898. In the following table we give the exports of roofing slate and manufactured stock from New York in the 11 months of this year:

| | Roofing, squares. | Manufactures, Value. |
|---|---|---|
| January | 8,955 | $5,669 |
| February | 14,850 | 8,634 |
| March | 18,700 | 9,311 |
| April | 12,700 | 8,496 |
| May | 19,666 | 11,147 |
| June | 12,300 | 8,797 |
| July | 11,050 | 9,051 |
| August | 9,079 | 8,343 |
| September | 14,800 | 5,623 |
| October | 10,150 | 3,804 |
| November | 10,100 | 3,129 |
| Totals | 142,350 | $82,004 |
| Total, 1898 | 186,924 | 93,463 |

The roofing slate was principally from the sea green district in Vermont, and from the Bangor and Pen Argyl regions in Pennsylvania. The manufactured slate consisted of school slates, blackboards, billiard slabs, mantles and similar mill stock. The drop in exports was due largely to decreased shipments to the United Kingdom, especially of roofing slate.

## IRON MARKET REVIEW.

New York, Dec. 22, 1899.

**Pig Iron Production and Furnaces in Blast.**

| Fuel used | Week ending Dec. 23, 1898. F'ces. | Tons. | Week ending Dec. 22, 1899. F'ces. | Tons. | From Jan., '98. Tons. | From Jan., '99. Tons. |
|---|---|---|---|---|---|---|
| An' racite | 29 | 22,050 | 47 | 42,175 | 1,117,728 | 1,717 755 |
| Coke..... | 148 | 208,850 | 210 | 249,575 | 10,020,573 | 11,293,441 |
| Charcoal. | 18 | 6,350 | 30 | 7,650 | 303,459 | 297,807 |
| Totals.. | 195 | 237,250 | 287 | 299,400 | 11,441,760 | 13,309,003 |

Comparative quiet continues in the iron market, and will probably last over the holidays, when little new business is expected at any time. The only movement of special interest has been the sale of some 30,000 tons of Bessemer pig at $25 for next year's delivery. Some inquiries for steel billets are noted also, and makers are inclined to be rather firmer about next year's prices.

Representatives of the mills making structural material have held a meeting this week, but no increase in prices was decided on. The demand promises to be large.

There has been some talk about purchases of Bessemer iron made in England for account of mills here. Inquiry does not give any definite results, and it seems probable that, while figures may have been asked for, no actual business has been done. English furnaces really have no iron to spare, and are behind on their home contracts.

The iron trade has not been affected by the Wall Street flurry. It is true that some iron and steel stocks went down in the flurry, but that has not affected the operations of the mills. Most iron men seem to be concerning themselves very little, and business shows no sign of trouble.

NOTES OF THE WEEK.

The Tennessee Coal, Iron and Railroad Company makes the following statement for the current year up to October 31st, 10 months:

| | 1898. | 1899. |
|---|---|---|
| Net earnings | $706.742 | $1,561,416 |
| Fixed charges | 522,566 | 502,593 |
| Surplus | $184,176 | $1,058,813 |

Net earnings increased $854,664, while expenses decreased $19,973; leaving an increase of $874,637 in surplus.

Exports of iron and steel from Great Britain for the 11 months ending November 30th were valued as below:

| | 1898. | 1899. |
|---|---|---|
| Iron and steel | £20,732,568 | £25,473,955 |
| Machinery | 16,681,675 | 18,057,838 |
| Totals | £37,413,243 | £43,531,793 |

The total shows an increase of £6,119,550, or 16.3%, this year. In addition to the total there were exported or sold to foreign countries ships —chiefly of iron and steel—valued at £8,562,922, bringing the total this year up to £52,094,715.

**Birmingham, Ala.** Dec. 18.

(From Our Special Correspondent.)

It is said the Philadelphia Furnace of the Sloss-Sheffield Steel and Iron Company, which was to have gone into blast some days since, will probably go in during this week. The delay was caused by a scarcity of fire-brick. The furnace is located at Florence. The Hattie Ensley furnace at Sheffield, belonging to the same company, will go into blast about the middle of January. It is stated that Rogers, Brown & Company have placed an order with the lessees of the Williamson furnace, which is located in this city, and which will hardly be ready to go into blast until after January, probably the middle of February, for 5,000 tons of pig iron, while other parties have contracted with the same furnace for 5,000 tons more. The same conditions prevail in the blowing in of the Trussville, the Gadsden, the Ironton and the Talladega furnaces.

There is a good inquiry being received, and the quotations remain firm and steady. The following quotations are still given: No. 1 foundry, $18.50@$19; No. 2 foundry, $17.75@$18.50; No. 3 foundry, $16.75@$17.50; No. 4 foundry, $16@$16.50; gray forge, $16@$16,25; No. 1 soft, $18.50@$19; No. 2 soft, $17.75@$18.50.

The demand for finished iron is very heavy. No time is being lost at the rolling mills in this State. There will be no interruption at the mills in this district on account of the holidays. Foundries and machine shops have plenty of work on hand and they are assured steady work for some time to come.

The Dimmick Pipe plant at North Birmingham is going up rapidly and it is believed it will be ready to begin operations shortly after the new year comes in.

The announcements of the past week include the story that the Woodstock Iron Company's property in the vicinity of Anniston, Ala., and which include two furnaces, both of which are about ready to go into operation, with ore lands and other additions, has been taken in by the Carnegie interests and will be put into motion. These furnaces have been out of blast for some time. The new concern, it is stated, will operate the properties on a large scale and will make further additions.

The Jenifer Furnace Company is pushing work on the property. During the past week W. H. Weller, the president of the company, completed a deal for coal properties in another section of the district and he is making other arrangements for raw material for the plant.

Much attention is being paid to the supply of raw material in this district. Ore mines in several parts of the State are being opened and are being worked hard. There are no fears that the furnaces will not have their needs filled.

**Buffalo.** Dec. 20.

(Special Report of Rogers, Brown & Co.)

The week just ending has naturally been a quiet one, although several large-sized contracts have been placed. Christmas shopping just now "has the call." Furnaces tributary to this market being practically sold up for the first six months of 1900, there is no evidence of pressure to sell. Shipments are still going forward as fast as the iron can be made and loaded, which is an unusual condition for this season. The scarcest quality on the list seems to be iron suitable for malleable manufacture. Our quotations below are on the cash basis f. o. b. cars, Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $24@$24.50; No. 2 strong foundry coke iron, Lake Superior ore, $23,50@$24; Ohio strong softener No. 1, $24.25@$24.75; Ohio strong softener No. 2, $23.25@$23.75; Jackson County Silvery No. 1, $31; Southern soft No. 1, $23.50; Southern soft No. 2, $22.50; Lake Superior charcoal, $26@$27; coke malleable, $24@$24.50.

**Chicago.** Dec. 11.

(From Our Special Correspondent.)

Pig Iron.—Business has been only moderate during the past week, and but few sales of any importance were made. Car-load up to a few hundred-ton sales were characteristic of the week, and the aggregate was not large. The demand now is wholly from foundries, which want iron quickly so that they may keep their contracts, but pig iron is hard to get, and the foundries are satisfied if they can get a quarter of what they order on quick delivery. Quotations on pig iron are very firm, and a decrease in prices is not at all probable. Some agents say that this spring will witness a greater scarcity of iron than that which existed this fall. Quotations are as follows: Lake Superior charcoal, $25.50@$26; local coke foundry No. 1, $24.50@$25; No. 2, $23.50@$24; No. 3, $22.50@$23; local Scotch No. 1, $25@$25.50; Southern coke No. 1, $23@$24; No. 2, $22@$23; No. 3, $21@$22. Southern No. 1 soft, $23@$24; No. 2 soft, $22@$23; Ohio strong softeners, $25@$26; malleable Bessemer, $25@$26.

**Cleveland, O.** Dec. 18.

(From Our Special Correspondent.)

Iron Ore.—The shipment of ore into Lake Erie ports for the season is about at an end. The cold and stormy weather of last week has put a stop entirely to the shipments from Lake Superior ports. A few cargoes yet remain to be brought from Escanaba on vessels which were chartered only ten days ago, which will close the season for both the shipments of coal and iron.

The past week has been one of great activity here in the sale of ores. It would be useless to place an estimate of the volume sold, but the transactions have been all along the lines of the non-Bessemer as well as the Bessemer ores, products of the older ranges as well as of those of later discovery and development. Prices obtained are said to have been those of the new lists made out by the Ore Association, all of which are decidedly higher than the figures for the present year. Reports will soon be made as to amounts sold, and will probably be made public during the present week. Quotations given are for ore for immediate delivery as follows: Specular and magnetic ores, Bessemer quality, $6@$6.25; specular and magnetic ores, non-Bessemer, $5@$5.15; hematite ores, Bessemer quality, $5@$5.25; red hematite ores, non-Bessemer quality, $4@$4.50.

Pig Iron.—Much anxiety is shown among manufacturers who, up to the present time, have made no contracts for the consumption of the coming season. The general impression now prevails that present high prices will continue and the consumers who postponed making purchases are beginning to feel disappointed. During the past week the trade has been fairly good. Demands were exceptionally good for about all the metal producers were willing to offer either of Bessemer, foundry or mill iron. Prices for all kinds and grades of iron are strong at the highest figures last reported. No new market values are named. The following are present quotations for iron f. o. b. Cleveland: Lake Superior charcoal, $26; Bessemer, $24.50; No. 1 foundry, $23.50; No. 2, $23; No. 1 Ohio Scotch, $22.50; No. 2, $22; gray forge, $21.

**Philadelphia.** Dec. 21.

(From Our Special Correspondent.)

Pig Iron.—Some rather surprising rumors are heard on the street to-day concerning efforts that are being made by certain large consumers of foundry forge and malleable irons for large quantities for the coming year. Malleable iron occupies but very little attention in this market, but forge and foundry are always selling. Several large foundries have rather suddenly shown a desire to make contracts for delivery during the second quarter of next year. The most careful inquiries fail to get at the inside of the rumors. One or two brokers who are familiar with what is going on say that in all probability large purchases of foundry iron will probably be made for delivery for the second quarter of next year, most of which will be for No. 2. It is impossible to get any further information. Provisions are unchanged, consumption is heavy, and stocks are an unknown quantity.

Billets.—Two or three very urgent buyers are closing for large supplies of billets next year. The only difficulty in the way is as to price.

Plate Iron.—A number of urgent buyers or from one to three months ago have been taken care of during the past few days, but there is more demand than can be promptly taken care of. There are no changes in quotations. Tank plates as low as 2.60c.

Structural Material.—Beams and channels are quoted all the way from 2.40@2.80c. The only statement that can be had to-day is that there is enough new work to be had when manufacturers are ready to take it to keep everything going nicely.

Steel Rails.—Inquiries from abroad were received within 24 hours, according to information obtained in a roundabout way, and it is said that the inquiries involve about 20,000 tons.

Old Rails.—Old iron rails are selling at about $27.50. Old steel rails have been negotiated for at $23.

Scrap.—In the absence of scrap for delivery the only information to be given is that coarse railroad scrap will bring $26; heavy steel scrap, $22; cast borings, $15; old car wheels, $22; iron axles, $30; steel axles, $28@$29.

**Pittsburg.** Dec. 20.

(From Our Special Correspondent.)

The iron and steel market has been unusually quiet this week, and this condition will likely continue until after the first of the year. Steel is very quiet, and no sales were made for this year, or next, during the week. Buyers are holding off for a while in anticipation of better rates; but according to leading dealers they will be disappointed, as it is believed that prices will advance instead of declining. Bessemer pig iron is firm, prices being stronger than any other line. A sale of 20,000 tons was made during the week at $25 Pittsburg, for the first half of next year. No sales of any consequence have been made beyond July 1st, and there is but little remaining unsold for the first half of 1900. All this year's product has been sold. There is but little interest taken in the market for the third quarter, although some sales have been made. A better demand is expected after January 1st. One of the leading dealers said to-day that in his opinion Bessemer pig iron will bring at least $30 a ton soon, after the opening of the new year. Another large dealer said it is impossible to make any prediction as to the possible course of the market, but it is always safe to say that there will be no decline and that higher prices are more likely to rule next year than the prevailing rates. The lull in the steel market is attributed to a desire of buyers to wait for better terms. Notwithstanding the fact that there is no demand for Bessemer steel billets prices for delivery next year are a dollar or two higher than last week. For the first half of next year billets are now quoted at $37@$38. The last billets sold for delivery this year were at $37. Sheet prices remain unchanged, but better rates are expected soon. The committee having in charge the preparation of plans for consolidating the sheet interests of the country have about completed the work, and a general meeting of manufacturers is to be called early in January to act on the report. An entirely different plan to the old one, which failed, will be considered.

Pig Iron.—The market is firm, and prices are more likely to advance than decline. Better rates were obtained this week than last. One concern bought 20,000 tons for delivery during the first half of next year at $25. Prices of foundry irons remain unchanged.

Steel.—The billet market continues in a state of decided dullness, and but little buying is expected for two or three weeks. Billets for next year's delivery are quoted this week at $37@$38. Open-hearth billets are still quoted at $45. The plate market is weak, but a stiffening of prices is expected soon.

Sheets.—There is no change in prices, but better rates are looked for with the opening of the year. If the plan for consolidating the interests now being prepared are adopted at a meeting of manufacturers to be held next month, it will

likely have the effect of strengthening prices. No. 28 sheets are quoted at 3c.

Ferro-manganese.—There is no change in prices, large lots selling at $100, and for small lots $125 is asked.

**New York.** Dec. 22.

The holiday season and approaching stock taking have taken a great deal of activity out of the local iron market and no improvement is to be expected before the middle of next month. Foreign business holds up pretty well considering the general situation. Shipments of machine tools and other engineering apparatus to France continue heavy. A recent shipment to Brazil included $75,000 worth of steel rails, $24,000 worth of railroad material, and $14,000 worth of trolley poles.

Pig Iron.—Transactions are mostly confined to small lots, but many Eastern foundries which thought they had iron enough on hand to last them well into next year are looking for further supplies. We quote for delivery to July, 1900; Northern brands, tidewater delivery: No. 1 X foundry, $25.50@$25.75; No. 2, $24.25@$24.75; No. 2 plain, $23.25@$23.75. Southern brands, New York delivery: No. 1 foundry, $23.25@$24.75; No. 2 foundry, $22.25@$22.50; No. 1 soft, $22.25@$22.50; No. 2 soft, $21.25@$21.5v; No. 3 foundry, $21.50.

Bar Iron and Steel.—The market for bars is much easier, but prices are unchanged as yet. We quote refined iron as high has 2.30c. on dock, and common 2.15c. Soft steel bars, 2.50c.

Steel Rails and Rail Fastenings.—Prices remain unchanged. We quote for standard sections $35@$36 f. o. b. Eastern mills. Smaller rails are quoted: 12-lbs., $40; 16-lb., $40; 20-lb., $40; 30-lb. to 40-lb., $38; 40-lb. to standard, $37, with the usual advance for small orders. We quote angle bars, 2.45c.; fish plates, 2.40c.; spikes, 2.75c.

Plates.—Prices have softened more, but buying is light. We quote for large lots at tidewater: Tank, ¼-in. and heavier, 2.70c.; tank, 3/16 in., 2.80c.; shell, 2.90c.; flange, 3c.; marine, 3.10c.; firebox, 3.10 c.; universals, 2.70c.

Structural Material.—Locally the demand is lighter. All kinds of speculations have had a set-back, and it is not likely that there will be any great renewal of activity in building before spring. We quote for large lots of steel at tidewater: Beams, 15-in., 2.45c.; tees, 2.45c.; channels, 2.45c.; angles, 2.45c.; with higher figures for prompt delivery and small lots.

## METAL MARKET.

NEW YORK, Dec. 22, 1899.

### Gold and Silver.

**Gold and Silver Exports and Imports**
At all United States ports in November and year.

| Metal. | November. | | Year. | |
|---|---|---|---|---|
| | 1898. | 1899. | 1898. | 1899. |
| GOLD. | | | | |
| Exports | $913 467 | $264,310 | $14,975 316 | $33,521.900 |
| Imports | 5,324,601 | 2,904,043 | 149,406,770 | 45,714,718 |
| Excess | I. $4,411,134 | I. $2,639,733 | I.$134,431,45: | I. $12,192,818 |
| SILVER. | | | | |
| Exports | 4.023 079 | 4 439,166 | 47,969,406 | 47,880,823 |
| Imports | 2,239,259 | 2,772,360 | 25,921,927 | 27,818,150 |
| Excess | E. $1,753,820 | E. $1,666,806 | E.$22,047,479 | E.$20,042,673 |

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

**Gold and Silver Exports and Imports, New York**
For the week ending December 21st, 1899, and for years from January 1st, 1899, 1898, 1897, 1896.

| Period. | Gold. | | Silver. | | Total Excess, Exp. or Imp. |
|---|---|---|---|---|---|
| | Exports. | Imports. | Exports. | Imports. | |
| We'k | $553,000 | $69,578 | $820.424 | $41,891 | E. $1,261,955 |
| 1899.. | 12.299,386 | 13,895,927 | 29,025,832 | 3,758.556 | E. 23,670,735 |
| 1898.. | 6,842,930 | 98,587,176 | 33,806,880 | 3,152 301 | I. 61,089,667 |
| 1897.. | 29,815,546 | 43,251,753 | 35,510,553 | 3,074 474 | E. 18,999,900 |
| 1896.. | 40 801,438 | 76,629,952 | 36,347,778 | 3,647,261 | I. 3,128,000 |

The United States Assay Office in New York reports the total receipts of silver at 61,000 oz. for the week.

**Average Prices of Silver per oz. Troy.**

| Month. | 1899. | | 1898. | | 1897. | |
|---|---|---|---|---|---|---|
| | Lond'n Pence. | N. Y. Cents. | Lond'n Pence. | N. Y. Cents. | Lond'n Pence. | N. Y. Cents. |
| January... | 27.42 | 59.36 | 26.29 | 56.77 | 29.74 | 64.79 |
| February.. | 27.44 | 59.42 | 25.89 | 56.07 | 29.68 | 64.67 |
| March..... | 27.48 | 59.64 | 25.47 | 54.90 | 28.96 | 63 06 |
| April..... | 27.65 | 60.10 | 25.95 | 56.02 | 28.36 | 61.85 |
| May..... | 28.15 | 61.23 | 26 31 | 56.98 | 27.86 | 60.42 |
| June..... | 27 77 | 60.43 | 27.09 | 58.61 | 27.58 | 60.10 |
| July..... | 27 71 | 60 26 | 27.32 | 59.06 | 27.36 | 59.61 |
| August.... | 27.62 | 60.00 | 27.48 | 59.54 | 24.93 | 54.19 |
| September | 27.15 | 58 89 | 28.05 | 60.68 | 25 66 | 55.04 |
| October .. | 26.70 | 57.98 | 27.90 | 60.42 | 26.77 | 57.57 |
| November | 27 02 | 58.67 | 27.93 | 60.60 | 26 87 | 57.93 |
| December. | ... .. | ..... | 27.45 | 59.42 | 26.83 | 58.01 |
| Year.... | .... | ..... | 26.76 | 58.26 | 27.55 | 59.79 |

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

**Prices of Foreign Coins.**

| | Bid. | Asked |
|---|---|---|
| Mexican dollars | $ .47½ | $ 49 |
| Peruvian soles and Chilean pesos | .43 | .45 |
| Victoria sovereigns | 4.85 | 4.88 |
| Twenty francs | 3.84 | 3.88 |
| Twenty marks | 4.74 | 4.79 |
| Spanish 25 pesetas | 4.78 | 4.82 |

**Average Prices of Metals per lb., New York.**

| Month. | COPPER. | | TIN. | | LEAD. | | SPELTER. | |
|---|---|---|---|---|---|---|---|---|
| | 1899. | 1898. | 1899. | 1898. | 1899. | 1898. | 1899. | 1898. |
| Jan..... | 14.75 | 10.99 | 22.48 | 13.87 | 4.18 | 3.65 | 5.34 | 3.96 |
| Feb..... | 18 00 | 11.28 | 24 20 | 14 08 | 4.49 | 3.71 | 6.28 | 4.04 |
| March... | 17.54 | 11.98 | 23.82 | 14 38 | 4.37 | 3.72 | 6.31 | 4.25 |
| April.... | 18.43 | 12.14 | 24.98 | 14.60 | 4.31 | 3.63 | 6.67 | 4.26 |
| May..... | 18.25 | 12 00 | 25.76 | 14.52 | 4.44 | 3.64 | 6.88 | 4.27 |
| June..... | 17 93 | 11 89 | 25 85 | 15.22 | 4.43 | 3.82 | 5 98 | 4.77 |
| July..... | 18 33 | 11.63 | 29.63 | 15.60 | 4.52 | 3.95 | 5.82 | 4.66 |
| August.. | 18.50 | 11 89 | 31.53 | 16.23 | 4.57 | 4.00 | 5.65 | 4.58 |
| Sept..... | 18 46 | 12.31 | 32 74 | 16.03 | 4.58 | 3.99 | 5.50 | 4.67 |
| October.. | 17.76 | 12.41 | 31 99 | 17.42 | 4.575 | 3.78 | 5.32 | 4.98 |
| Nov..... | 16.93 | 12.86 | 28.51 | 18.20 | 4.575 | 3.70 | 4.64 | 5.29 |
| Dec ..... | ..... | 12.93 | ..... | 18.30 | .. | 3.76 | ..... | 5.10 |
| Year..... | ..... | 12.03 | ..... | 15.70 | ..... | 3.78 | ..... | 4.57 |

The price given in the table is for Lake Copper. The average price of electrolytic copper in January was 14.26c.; in February it was 17.02c.; in March, 16.35c.; in April, 17.12c.; in May, 17.2 c.; in June, 16.89c.; in July, 17.09c.; in August, 17.42c; in September, 17.34c.; in October, 16.94c; in Novemb r, 16.49c.

### Financial Notes of the Week.

The upset in Boston last week was followed by a sharp flurry in Wall Street this week, which knocked down quotations sharply and almost created a panic. Matters quieted down when several of the banks made up a pool and offered $10,000,000 in call loans. The reaction is commented on in another column. General business has been very little affected by the Stock Exchange excitement.

High rates in London—and perhaps some special inducements said to have been offered by the Bank of England—have started an export movement of gold. The engagements reported for Saturday's steamers, with the gold already shipped, amount to about $7,500,000. It is possible that some more will go. The movement has no special significance, except that money is needed in London and people are willing to pay for it.

There has been very good foreign buying of silver, both spot and forward. The approach of the holiday season and the fact that money is dearer, with the general uneasiness in the political and financial situation, all tend to lower the price and lessen the inquiry for silver abroad.

The statement of the New York Banks—including the 63 banks represented in the Clearing House—for the week ending December 16th, gives the following totals, comparison being made with the corresponding weeks in 1898 and 1897:

| | 1897. | 1898. | 1899. |
|---|---|---|---|
| Loans and discounts | $506,679,300 | $708.555,800 | $676,409,900 |
| Deposits | 669 981,400 | 806,912,100 | 739,540,300 |
| Circulation | 15,751,100 | 16,341 700 | 16,765,300 |
| Reserve: | | | |
| Specie | 104.267,000 | 164 325,100 | 141.230.600 |
| Legal tenders | 78,931,900 | 54,376,300 | 50,680,300 |
| Total reserve | $183,198,900 | $218,701,400 | $191,910,900 |
| Legal requirements | 167,742,850 | 201,728,025 | 184,885,075 |
| Balance, surplus | $15,726,050 | $16,978,375 | $7,025,825 |

Changes for the week, this year, were increases of $1,768,500 in legal tenders, and $166,300 in surplus reserve; decreases of $5,054,400 in loans and discounts, $4,545,200 in deposits, $340,000 in circulation, and $2,738,500 in specie.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings of the corresponding dates last year:

| Banks. | 1898. Gold. | 1898. Silver. | 1899. Gold. | 1899. Silver. |
|---|---|---|---|---|
| N.Y. Ass'd.. | $164,325,100 | ..... | $141,230,600 | ..... |
| England.... | 154,944,395 | ..... | 149.027,795 | ..... |
| France..... | 365,414,830 | $241,931,650 | 376,667,490 | $233,064,895 |
| Germany ... | 133,510,000 | 68,780,000 | 121,980,000 | 62,840,000 |
| Spain..... | 53,310,000 | 24,275,000 | 68,000,000 | 70,875,000 |
| Aus.-Hun .. | 176 665 000 | 62,270,000 | 193 885,000 | 57,100,000 |
| Neth'l'ds ... | 21.575,000 | 33 625,000 | 18,785 000 | 29,525,000 |
| Belgium.... | 15,670 000 | 7,835,000 | 15 425,000 | 7,510,000 |
| Italy ..... | 74,896,000 | 11,650,000 | 77 255,000 | 7.470.000 |
| Russia..... | 497,615,000 | 18,475,000 | 431,885,000 | 24,840,000 |

The returns of the Associated Banks of New York are of date of December 16th, and the others are of date of December 14th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

**Imports and Exports of Metals.**

| Port. | Week, Dec. 20. | | Year 1899. | |
|---|---|---|---|---|
| | Expts. | Impts. | Expts. | Impts. |
| ***New York.** | | | | |
| Aluminum.....long tons | ..... | ..... | ..... | 14 |
| Antimony ore... " " | ..... | ..... | ..... | 1,597 |
| " regulus.. " " | ..... | 13 | ..... | 1,104 |
| Chrome ore..... " " | ..... | 112 | ..... | 2,388 |
| Copper, fine..... " " | 1,926 | 250 | 59,833 | 26,287 |
| " matte.. " " | ..... | ..... | 1,0 5 | 1,099 |
| " ore..... " " | ..... | 2.100 | ..... | 49,821 |
| " ash..... " " | ..... | ..... | ..... | 220 |
| " sulphate " " | ..... | ..... | 11,737 | ..... |
| " other ... " " | ..... | ..... | ..... | 135 |
| Cop-nickel matte " " | ..... | ..... | ..... | 53 |
| Ferro-mangan'se " " | ..... | ..... | ..... | 278 |
| Iron ore..... " " | ..... | ..... | ..... | 50 |
| " pig, bar, rod " " | ... | ‡105 | 6.481 | 4,190 |
| " pipe..... " " | 175 | ..... | 27,257 | ..... |
| " plates, sheets " " | 39 | ..... | 787 | 251 |
| " other..... " " | ..... | ..... | 1,209 | ..... |
| Lead..... " " | 1,012 | ..... | 54,247 | 51.765 |
| " ore.. ..... " " | ..... | ..... | ..... | 1,191 |
| Manganese, ore. " " | ..... | ..... | ..... | 6,455 |
| Metals, old scrap " " | 17 | 126 | 4,903 | 6,481 |
| " Composition... " " | ..... | ..... | 6.886 | 255 |
| Nails..... " " | 635 | ..... | 19,335 | ..... |
| Nickel ..... " " | 10 | 15 | 1,909 | 120 |
| " Ore ..... " " | ..... | ..... | ..... | 4,071 |
| §Railr'd material " " | 514 | 180 | 7,980 | 4,093 |
| Rails, old..... " " | ..... | ..... | 15,417 | 468 |
| Spiegeleisen..... " " | ..... | ..... | ..... | 1,170 |
| Steel bars, plates " " | 230 | ‡245 | 40,913 | 16,933 |
| " rails..... " " | 3,523 | ..... | 51,979 | 150 |
| " hoops..... " " | ..... | ..... | 831 | 100 |
| " wire..... " " | 40 | ..... | 38,333 | 1,225 |
| " not speci'd. " " | ..... | 148 | ..... | 11.917 |
| Tin ..... " " | ..... | 225 | ..... | 26,148 |
| " dross or ashes " " | ..... | ..... | 63 | ..... |
| " and black plates" " | ..... | ‡925 | ..... | 35,748 |
| Zinc..... " " | 10 | ..... | 282 | 358 |
| " dross..... " " | ..... | ..... | 437 | ..... |
| " ashes, skim " " | 7 | ..... | 2,150 | 299 |
| " ore..... " " | ..... | ..... | 9,919 | ..... |
| " oxide..... " " | 130 | ..... | 4,324 | 283 |
| **†Baltimore.** | | | | |
| Alumina ..... bags | ..... | ..... | ..... | 3,479 |
| Antimony regulus...casks | ..... | ..... | ..... | 286 |
| Chrome Ore.....long tons | ..... | ..... | ..... | 2,300 |
| Copper, fine..... " " | 771 | 139 | 36,072 | 2,783 |
| " matte... " " | ..... | ..... | ..... | ..... |
| " sulphate " " | 2 | ..... | 1,589 | ..... |
| " pipe..... " " | ..... | ..... | 100 | ..... |
| Ferro-manganese " " | ..... | ..... | ..... | 2,163 |
| Ferro-silicon..... " " | ..... | ..... | 184 | 96 |
| Iron pig, bar. etc. " " | ..... | 66 | 1,233 | 8,835 |
| " ore..... " " | ..... | 4,515 | ..... | 267,232 |
| " pyrites..... " " | ..... | 820 | ..... | 50,244 |
| Manganese ore.. " " | ..... | ..... | ..... | 77,013 |
| Metals, old & Rails" " | ..... | ..... | 4,604 | 251 |
| Nails ..... " " | ..... | ..... | 741 | ..... |
| Pipe,iron & steel " " | 598 | ..... | 14,558 | ..... |
| Spiegeleisen..... " " | ..... | ..... | ..... | 1,337 |
| Steel, bars,pl'es.. " " | 659 | ..... | 36,738 | ..... |
| " wire ..... " " | 326 | 6 | 1,868 | 66 |
| " rails ..... " " | ..... | ..... | 73,473 | 276 |
| not specified.. " " | ..... | ..... | 2,943 | 23 |
| Tin..... " " | ..... | ..... | 563 | ..... |
| " and blackplates" " | ..... | 127 | ..... | 2,992 |
| " other..... " " | ..... | ..... | 43 | ..... |
| Zinc..... " " | ..... | ..... | 25 | 5 |
| " dross, skim. " " | ..... | ..... | 362 | ..... |
| " oxide..... " " | ..... | ..... | 19 | ..... |
| ***Philadelphia.** | | | | |
| Antimony ....long tons | ..... | ..... | ..... | 10 |
| Chrome ore ... " " | ..... | ..... | ..... | 3,060 |
| Copper, fine..... " " | ..... | ..... | 540 | ..... |
| " ore..... " " | ..... | 12,111 | ..... | 38,618 |
| " old..... " " | ..... | ..... | ..... | 11 |
| Ferro-manganese " " | ..... | ..... | ..... | 1,572 |
| Ferro-silicon..... " " | ..... | ..... | ..... | 16 |
| Iron, pig..... " " | ..... | ‡760 | ..... | 7,190 |
| " ore..... " " | ..... | ‡11,500 | ..... | 292.479 |
| " pyrites..... " " | ..... | ..... | ..... | 10.153 |
| Manganese ore.. " " | ..... | ‡600 | ..... | 87,161 |
| Steel sheets..... " " | ..... | ..... | ..... | 510 |
| Spiegeleisen..... " " | ..... | ..... | ..... | 2,120 |
| Tin..... " " | ..... | ..... | ..... | 1.070 |
| " and black plates" " | ..... | ‡330 | ..... | 1,877 |
| Zinc dust ..... " " | ..... | ..... | ..... | 10 |
| " ore..... " " | ..... | ..... | 3,093 | ..... |

**Total United States.§§**

| Articles. | October. | | Jan.—Oct. | |
|---|---|---|---|---|
| | Expts. | Impts. | Expts. | Impts. |
| Antimony.. long tons | ..... | 117 | 8 | 1,29 |
| " ore.... " " | ..... | 98 | ..... | 5778 |
| Copper fine . " " | 10,293 | 3,737 | 84.749 | 2 ,903 |
| " su'phate . " " | 165 | ..... | 11,800 | ..... |
| " ore & matte " " | 342 | 12,717 | 4,347 | 19,916 |
| Iron, pig & bar.. " " | 14,182 | 7,025 | 218,102 | 43,634 |
| " ore..... " " | 1,193 | 72,931 | 22.283 | 498,330 |
| Iron& steel plates " " | 6.124 | 1,191 | 54,263 | 4,319 |
| Iron & steel rails " " | 37,273 | 795 | 223,270 | 1,918 |
| " " wire " " | 11,369 | 149 | 97,826 | 2,147 |
| Steel, billets, rods, etc..... " " | 3 006 | 3,258 | 66,726 | 25,282 |
| Lead, pigs, bars & old..... " " | 3 | 1 | 49 | 208 |
| Lead in ore..... " " | 4,598 | 4,941 | 56,969 | 69,200 |
| Nails, cut..... " " | 483 | ..... | 8,162 | ..... |
| " wire..... " " | 2,266 | ..... | 24,265 | ..... |
| Tin..... " " | 33 | 1,177 | 362 | 23,294 |
| " &black plates " " | 19 | 5,769 | 242 | 48.751 |
| Zinc ..... " " | 39 | 174 | 5,803 | 1,078 |
| " ore ..... " " | 2,972 | ..... | 21,259 | ..... |

*New York Metal Exchange returns. †By our Special Correspondent. §Not specified. ‡Week ending Dec. 15th §§ Monthly returns of the Treasury Department.

The duties on metals under the present tariff law are as ollows: Antimony, metal or regulus, ¾c. a lb. Lead, 1½c. a lb. on lead in ores; 2½c per lb. on pigs, bars etc; 2½c on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1½c. per lb. in pigs and bars; 2c. on sheets, etc. Copper, tin and platinum are free of duty.

The statement of the United States Treasury on Wednesday, December 20th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week.

| | Dec. 13. | Dec. 20. | Changes. |
|---|---|---|---|
| Gold | $243,296,704 | $241,448,286 | D. $1,848,418 |
| Silver | 9,692,458 | 9,742,214 | I. 49,756 |
| Legal tenders | 15,548,458 | 15,840,194 | I. 291,736 |
| Treas notes, etc. | 1,153,335 | 1,002,869 | D. 150,466 |
| Totals | $269,690,955 | $268,033,563 | D. $1,657,392 |

Treasury deposits with national banks amounted to $82,594,339, an increase of $213,420 during the week.

Shipments of silver from London to the East for the year up to December 7th, 1899, are reported by Messrs. Pixley & Abell's circular as follows:

| | 1898. | 1899. | Changes. |
|---|---|---|---|
| India | £3,988 365 | £4,939,725 | I. £951 360 |
| China | 635.391 | 1,318,478 | I. 683.087 |
| The Straits | 395,405 | 274,785 | D. 120,620 |
| Totals | £5,019,161 | £6,532,988 | I. £1,513,827 |

Arrivals for the week, this year, were £147,000 in bar silver from New York, £41,000 from Australia, and £36,000 from the West Indies; total, £224,000. Shipments were £130,000 in bar silver to Bombay, £52,500 to Shanghai, and £5,279 to Singapore; total, £187,779.

Shipments of specie from San Francisco in November included $284,935 gold and $911,396 silver. For the 11 months ending November 30th the shipments were as follows:

| | Gold. | Silver. | Totals. |
|---|---|---|---|
| Hong Kong | $68,337 | $5,229,684 | $5,298,021 |
| Shanghai | ..... | 635,442 | 635,442 |
| Japan | 6 395 | 200 | 6,595 |
| New Zealand | 2,500 | ..... | 2,500 |
| South Sea Islands | 3,937 | 1,000 | 4,937 |
| Central America | 4,636 | 5,964 | 10,600 |
| Mexico | 1,375 | 27,000 | 28,375 |
| Total foreign | $87,180 | $5,899,290 | $5,986,470 |
| Honolulu | 2,405,595 | 152,857 | 2.558,452 |
| New York | 9,323,749 | 189 005 | 9,512,754 |
| Totals | $11,816,524 | $6,241,152 | $18,057,676 |
| Totals, 1898 | 42,686,885 | 7,919,026 | 5),605,911 |

The silver shipments this year included $420,496 in Mexican dollars in November and $2,341,557 in the 11 months, against $264,096 and $4,032,385, respectively, last year.

The coinage executed at the Mints of the United States in November and the 5 months of the fiscal year is reported by the Bureau of the Mint as below:

| | —November— Pieces. | Value. | —Five months— Pieces. | Value. |
|---|---|---|---|---|
| Double eagles. | 147,000 | $2,940 000.00 | 1,075,011 | $21,500.220.00 |
| Eagles | 316,920 | 3,169,200.00 | 1,464,938 | 14,649,380.00 |
| Half eagles | 99,300 | 9[illegible],500.00 | 354,314 | 1,771,570.00 |
| Quart'r eagles | 15,200 | 38,000.00 | 15,231 | 38,077.50 |
| Total gold | 578,420 | $6,643,700.00 | 2,909 494 | $37,959,247.50 |
| Dollars | 950,000 | 950,000.00 | 4,056,145 | 4,056,145.00 |
| Half dollars | 1,696,000 | 848,000.00 | 6,580,556 | 3,295,278.00 |
| Qr. dollars | 2,144,000 | 536,000.00 | 11,076,145 | 2,769,036.25 |
| Dimes | 2,780,000 | 278,000 00 | 12,790,145 | 1,279,014.50 |
| Total silver | 7,570,000 | $2,612,000.00 | 34,502,991 | $11,399,473.75 |
| Five c. nickels | 2,830,000 | 141,500.00 | 16,590,320 | 829,516.00 |
| One c. bronze | 11,387,000 | 113,870.00 | 23,927,320 | 239,273.20 |
| Total minor | 14,217,000 | $255,370.00 | 40,517,640 | $1,068,789.20 |
| Total coinage | 22,365,420 | $9,511,070.00 | 77,930,125 | $50,427,510.45 |

As compared with the previous month, the total coinage in November shows a decrease of $2,327,039.

The foreign merchandise trade of Great Britain for the 11 months ending November 30th is given by the Board of Trade returns as below:

| | 1898. | 1899. |
|---|---|---|
| Imports | £425,283.431 | £441,339,264 |
| Exports | 267,497,201 | 302,015,816 |
| Excess, imports | £157,786,230 | £142,323,448 |

The imports show an increase of £19,055,833, or 4.5%, and the imports one of £34,518,615, or 12.9%; leaving a decrease of £15,462,782, or 9.8%, in the excess of imports. The movement of gold and silver for the 11 months is reported as follows:

| | Imports. | Exports. | Excess. |
|---|---|---|---|
| Gold: | | | |
| 1899 | £30,535,075 | £20,080 087 | Imp. £10,454,988 |
| 1898 | 41,469,773 | 32,131,541 | Imp. 9,338,232 |
| Silver: | | | |
| 1899 | 11,783,419 | 13,868,270 | Exp. 2,[illegible]84,851 |
| 1898 | 13,500,468 | 12,704,108 | Imp. [illegible]96,360 |

There has been a notable decrease in the gold movement this year—both exports and imports—the falling off being in the exchange movements with the United States and European countries. The United States furnished this year 68.2% of the silver imported, against 63.5% last year.

Indian exchange has been slightly easier, and while all the Council bills offered in London were taken, the price was a fraction lower, at 16.06d. per rupee. There has been only a moderate buying of silver in London on Indian account.

## Other Metals.

### Daily Prices of Metals in New York.

| December | Sterling Exchange. | Silver. Fine oz. Cts. | Silver. London. P'nce | Copper. Lake cts. ℔ lb. | Copper. Electrolytic. ℔ lb. | Copper. Lond'n standard £ ℔ ton. | Tin, cts. ℔ lb. | Lead cts. ℔ lb. | Spelter, cts. ℔ lb. |
|---|---|---|---|---|---|---|---|---|---|
| 16 | 4.87¼ | 59⅜ | 27⅛ | 16⅝ | 15½ | ..... | 25 | 4.65 | 4.75 |
| 18 | 4.87½ | 59⅜ | 27⅛ | 16⅝ | 15½ | 72 10 0 | 25 | 4.65 | 4.70 |
| 19 | 4.87¼ | 59½ | 27⅛ | 16⅝ | 15½ | 71 10 0 | 25 | 4.65 | 4.70 |
| 20 | 4.87¼ | 59 | 27⅛ | 16¼ | 15⅝ | 70 0 0 | 24⅞ | 4.65 | 4.65 |
| 21 | 4.87¼ | 59 | 27⅛ | 16⅛ | 15⅝ | 67 0 0 | 24¾ | 4.65 | 4.65 |
| 22 | 4.87½ | 58¾ | 26¾ | 16⅛ | 15⅛ | 68 5 0 | 24½ | 4.65 | 4.65 |

The quotations given for electrolytic copper are for cakes, ingots and wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The unsettled condition of affairs both here and abroad has not failed to affect this article. Not that prices here suffered quite as heavy a decline as they did abroad and as did the values of other commodities, but it has resulted in an utter stagnation of business. We have to quote Lake 16@16¼c.; electrolytic in cakes, wirebars or ingots, 15½@15¾c., and cathodes 15⅝@15½c.

In London, as indicated above, the decline has been much more pronounced. When we last went to press the price for standard was £72 10s. On Monday, the market opened unchanged, but on Tuesday declined to £71 10s., on Wednesday to £70, at which it opened on Thursday, but suffered the heaviest drop of the week later in the day, when the price declined to £67, closing today at £68 5s.@£68 7s. 6d. for both spot and 3 months.

A feature worth mentioning is the fact that the three months price is no lower than that for spot, while a few days ago the backwardation amounted to £2. It would seem as though this last decline had been a little overdone; at least, it does not seem fully justified by the conditions now ruling the copper market. Consumption both here and abroad continues at a good rate, the former being asserted by manufacturers, here, the latter by the very large shipments which have been made from this side in the course of this month, all of which have gone directly into consumption.

Diligent inquiries which we have made tend to show that most producers are sold up and others nearly so for their January and February product, and the demand which is liable to set in with the beginning of the new year would probably tend to steady the market. Refined and manufactured sorts are quoted: English tough, £73 10s.; best selected, £74@£75; strong sheets, £78; India sheets, £77; yellow metal, 6½d.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the companies, was as follows for November and the 11 months ending November 30th, in long tons (2,240 lbs.) of fine copper:

| | November. 1898. | November. 1899. | Eleven months. 1898. | Eleven months. 1899. |
|---|---|---|---|---|
| U. S. reporting mines | 18,050 | 19,617 | 199,590 | 210,218 |
| U. S. outside sources | 1,800 | 3,400 | 16,200 | 28,000 |
| Total U. S | 19,850 | 23.017 | 215,790 | 238,218 |
| Foreign reporting mines | 7,081 | 7,896 | 76,118 | 81,880 |
| Totals | 26,931 | 30.913 | 291,908 | 320,098 |
| Exports, U. S. | 14,741 | 10 809 | 131,893 | 103,364 |

The November production of the United States was 963 tons less than that for October. For the 11 months the increase in production was 22,428 tons, or 9.4%; of this, 10,628 tons came from the reporting mines, and 11,800 tons from the outside sources. In United States exports there was a decrease of 28,529 tons, or 21.6%, this year. The foreign reporting mines showed an increase of 5,762 tons, or 7.6%, in production.

Imports of copper into Great Britain for the 11 months ending November 30th were, in long tons:

| | 1898. | 1899. |
|---|---|---|
| Ore | 82,515 | 118,131 |
| Matte and precipitate | 69,785 | 73 475 |
| Fine copper | 62,132 | 53,925 |

The total this year was equal to 92,844 long tons of fine copper, against 105,276 tons last year. The United States furnished this year 490 tons ore, 4,995 tons matte and 19,999 tons fine copper.

Tin.—The erratic movements in this article continue, except so far as metal for spot delivery is concerned, for which the price has been fairly well maintained at 25c. and probably will be until further supplies come to hand, which will be toward the end of this or the beginning of next year. We quote spot and December, 24¾@25c.; January, 23½, and February, 23c.

The London market, which closed last week at £109, opened on Monday at £106; closed on Tuesday at £104; opened on Wednesday at £103 and remained steady at this price until to-day, the closing figure being £103 8s. 9d.@£103 10s. for spot, £105 3s. 9d.@£105 5s. for 3 months.

Imports of tin into Great Britain for the 11 months ending November 30th were 24,475 long tons, whereof 17,783 tons were from the Straits Settlements, 2,745 tons from Australasia, and the balance from other countries. The total last year was 17,972 tons; showing a gain of 6,503 tons, or 36.1%, this year. Exports of tin this year were 16,093 tons, against 14,296 tons in 1898.

The supplies of tin in sight on December 1st are reported as below, in long tons of 2,240 lbs.:

| | In store. | Afloat. | Totals. |
|---|---|---|---|
| London | 5,846 | 3,430 | 9,276 |
| Holland | 3,222 | 1,542 | 4,764 |
| U. S., exc. Pacific ports | 2,717 | 2,315 | 5,032 |
| Total | 11,785 | 7,287 | 19,072 |

The total shows an increase of 916 tons, or 5.1%, over November 1st; but a decrease of 2,631 tons, or 12.1%, as compared with December 1st, 1898.

Lead is the only metal which has remained not only steady but very firm. Stocks in first hands appear to be exhausted. Consumption keeps up well and the demand likewise. Prices are unchanged at 4.65c. New York and 4.55c. St. Louis.

Conditions in Europe have remained stationary throughout the week, the closing prices being the same as those recorded last week, £17 7s. 6d. for Spanish, and £17 10s. for English lead.

Imports of lead into Great Britain for the 11 months ending November 30th are reported as below, in long tons:

| From: | 1898. | 1899. |
|---|---|---|
| United States | 28,292 | 29,162 |
| Australasia | 37,515 | 50,754 |
| Spain | 87,524 | 90,062 |
| Other countries | 15,892 | 11,006 |
| Total | 169,223 | 180,984 |

The total increase this year was 11,761 tons, or 6.9%. The lead credited to the United States is chiefly Mexican lead, refined here in bond.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is strong but quiet. Nominal price, 4.60c. for common. Demand light.

Spelter.—The improvement has not been fully maintained. The demand is not quite so urgent as it was last week and the offerings are a little more plentiful. We quote the market 4.65@4.75c. New York and 4.45@4.55c. St. Louis.

Prices in Europe must be quoted £20 2s. 6d. @£20 5s. for ordinaries, and £20 7s. 6d.@£20 10s. for special brands.

Imports of spelter or metallic zinc into Great Britain for the 11 months ending November 30th were 63,804 long tons, against 69,509 tons in 1898; a decrease of 5,705 tons, or 8.2%, this year.

Antimony is without any change: Cookson's, 10½@11c.; Hallett's, 9¾@9⅞c.; U. S. Star, 9½@9⅝c.

Nickel is firm and demand very brisk. Quotations are firm at 40 and 45c., according to size of order.

Platinum.—Demand is good, and prices are firmer. In large lots we quote $17.75, and for smaller quantities, $18 per oz., in New York.

For chemical ware (crucibles and dishes), best hammered metal, we quote as follows: In lots of 250 grams or more, 67½c. per gram, and for smaller quantities, 70c. per gram; unmanufactured platinum will be supplied in same quantities at 2c. less per gram.

Quicksilver.—The New York price is unchanged at $51 per flask for large lots. Smaller quantities sell at $52.50@$54. The London quotation is £9 12s. 6d., with the same price named from second hands.

Imports of quicksilver into Great Britain for the 11 months ending November 30th were 3,877,184 lbs. (4,031,941 lbs. in 1898). Exports were 2,187,402 lbs. (2,207,601 lbs., 1898); leaving a balance of 1,689,782 lbs. consumed or added to stocks this year, against 1,824,340 lbs. in 1898.

The Minor Metals.—Quotations are given below for New York delivery:

| Aluminum. | Per lb. | | Per lb. |
|---|---|---|---|
| No. 1, 99% ingots | 33@37c. | Bismuth | $1.60 |
| No. 2, 90% ingots | 31@34c. | Magnesium | $2.75@$3 |
| Rolled sheets | 42c. up | Phosphorus | 40@50c. |
| Alum.-bronze | 20@23c. | Tungsten | 70c. |
| Nickel-alum | 33@39c. | Ferro-tungsten, 60% | 60c. |

Variations in price depend chiefly on the size of the order.

## LATE NEWS.

(From Our Special Correspondent.)

Birmingham, Ala., Dec. 20th.—In the statement for November of iron shipments the following figures are given: Pig iron shipments from the Alabama and Tennessee field for November, 137,108 tons, an increase over last year of 14,100 tons; net increase for the 11 months, 230,808 tons. Pig iron shipments from the Birmingham District alone in November were 86,429 tons, an increase of 8,008 tons; net increase for 11 months, 99,014 tons.

Cast iron pipe shipments from the Alabama and Tennessee field for November were 6,160 tons, a decrease from last year of 5,105 tons; net increase for 11 months, 20,990 tons. Cast iron pipe shipments from the Birmingham District alone for November amounted to 1,179 tons, a decrease of 198 tons; net increase for 11 months, 13,546 tons.

## CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 750.)

**New York.** Dec. 22.

Heavy Chemicals.—Foreign goods are scarce on spot owing to limited freight room from the other side. Alkali meets regular contract demand. Caustic soda, domestic high test, shows improved inquiry, while foreign sold over next year at $2.30 per 100 lbs. Sal soda, domestic, did large business for next month's delivery at quotations, while foreign holds firm. Bicarb soad is in good demand for export. Chlorate of potash crystels are limited on spot, while powdered is quiet. Bleaching powder is unchanged.

| Articles. | Domestic. | | Foreign. |
|---|---|---|---|
| | F.o.b. Works. | In New York. | In New York. |
| Alkali, in bags. | 80@85c. | 95@1.00 | 95@1.00 |
| Caustic Soda, high test.... | $1.85@2.00 | $2.00@2.05 | $2.15@2.30 |
| 98% powd.... | ..... | 3 12½@ 3.50 | ..... |
| 60@74% pwd | ..... | 2.50@ 2.62½ | ..... |
| Sal Soda | 60@70c. | ..... | 67½ |
| " conc. | 1.45@1.75 | ..... | 1.60@1.65 |
| Bicarb. Soda.. | 1.25@1.37½ | ..... | 2.25@2.37½ |
| " " extra | 3.25@3.50 | ..... | |
| Bleach. Pdr., Eng. prime.. | ..... | ..... | 2.37½@2.50 |
| other br'nds. | ..... | ..... | 2.15@2.25 |
| Chl. Pot. cryst | ..... | 8.75@9.00 | 9.25@9.37½ |
| " powd. | ..... | 9,12½@9.37½ | 9.50@9.62½ |

Prices are generally for large quantities, and in many cases depend upon make, test and package.

Acids.—Big business done in acetic for shipment at quotations. More inquiry for oxalic and muriatic, while next year's contracts for sulphuric acid are about closed up.

Quotations are in large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

| | | | |
|---|---|---|---|
| Acetic, No.8..... | $1.60@1.75 | Nitric, 42°..... | 4.75@ 5.00 |
| Blue Vitriol, best | 5.00@5.25 | Oxalic..... | 5.75@ 6.00 |
| Muriatic, 15°. ... | 1.20@ 1.25 | Sulphuric, 66°.... | 1.20@ 1.25 |
| Muriatic, 20°. . | 1.35@ 1.40 | Sulphuric, 60° | 1.05@ 1.10 |
| Muriatic, 22°..... | 1.50@ 1.55 | Bulk 50° ton.... | 16@17.00 |
| Nitric, 36° ..... | 3.87½@4.12½ | Sulphurous, 100% | |
| Nitric, 38°..... | 4.12½@4.37½ | $SO_3$ anhydrous. | 8.00@10.00 |
| Nitric, 40°..... | 4.37½@ 4.75 | | |

Brimstone.—Arrivals at New York were 1,500 tons. Spot best unmixed second are quoted $21.50@$22, and shipments $21@$21.25 per ton. Best thirds are $2 less per ton. Imports into Great Britain in the 11 months ending November 30th were 19,652 long tons, against 17,116 tons in 1898.

Pyrites.—Demand has increased. Spanish and domestic Virginia pyrites are higher. New contracts for next year are being booked. Freight rates are high. This year's business is considerably better than last, owing to the heavier consumption of pyrites by sulphuric acid makers.

Imports of pyrites into the United Kingdom in the 11 months ending November 30th were 632,204 long tons, against 598,964 tons in 1898.

We quote American pyrites as follows: Mineral City, Va., lump ores, $4.50 per long ton (basis 42%), and fines $4.20; Charlemont, Mass., lump, $5.50, and fines $4.75; Pilley's Island, lump, $6.50, and fines $4.50 per long ton, delivered in New York. Spanish pyrites, 13@15c. per unit, according to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46% to 51% of sulphur; America, 42% to 44%, and Pilley's Island, N. F., 50%.

Fertilizing Chemicals.—Stocks are pretty well sold up, owing to the improved demand, especially from Southern manufacturers. Sulphate of ammonia shipments to the United States in November amounted to 768 long tons. Market is firm at quotations. Domestic gas sulphate of ammonia is offered at $2.92½ per 100 lbs. f. o. b. Boston.

| Articles. | F. o. b. Wks. | In N. Y. |
|---|---|---|
| Potash, muriate, 80@85% | 100 lbs. ..... | $1.78 |
| " " 95% " | ..... | 1.81 |
| " sulphate. 90% " | ..... | 1 98½ |
| " " 96% " | ..... | 2.10½ |
| " d'ble m're salt, 48@53% | 100 lbs. ..... ..... | 66c. |
| " " " " 30% " | ..... | 89c. |
| " kainit, 12.4% | long ton. ..... | 8.70@8.95 |
| " sylvanit.. | per unit. ..... | 37@38c. |
| Sulph. Am., gas (25%) | ....100 lbs. ..... | 2 90@2.92½ |
| " " bone..... | " ..... ..... | 2.80 |
| Blood, dried, h-gr, Chi. | per unit 1.72½@1.75 | ..... |
| " " " N.Y., | " ..... ..... | 1.90 |
| Azotine..... | " 1.75@1.80 | 1.80@ 1.85 |
| Bone black, diss., 17@18% | ...ton ..... .. | 16.00@16.50 |
| Fish scrap, acid ..... | " 10.50@11.00 | 12 50 |
| " " dried ..... | " 19.50@20 | 21.50 |
| Tankage h. gr., Chicago.... | " 15@15.50 | 21.00 |
| " concentrated.. | unit. 1.60 | 1.95 |
| " bone. . ... | ton. ..... | 20.00@21.00 |
| Bone, steam gd, domestic.. | " ..... ..... | 21.00@23.00 |

The quotations on potash are on the basis of foreign invoice weights, tares and analysis, in quantities of not less than 500 tons bulk salts or 50 tons concentrated salts.

Nitrate of Soda.—Market easier. Arrivals at this port were 12,472 bags. Quotations are $1.82½@$1.85 per 100 lbs. for spot, and $1.65@$1.75 for shipment.

Phosphates.—Large consumers anticipate lower prices, but producers inclined otherwise. Abroad quotations are easier, but freights continue high. A charter is noted of 1,536 tons from Tampa to Helsingborg at 22s., sailing January 10th.

Latest quotations for the European market, c. i. f. United Kingdom or North Sea ports, are as follows: Florida high grade rock (77@80%), 8½@8¾d. ($13.26@$13.65 per long); Florida pebble (68@73%), 7¼d. ($9.80 per ton); Florida Peace River (58@63%) 7¼d. ($9.00 per ton); Tennessee high grade rock (78@80%), 7d. ($11 per ton); South Carolina (63%) rock, 6½ d. ($8.19 per ton); Algerian (63@70%) rock, 7¼d. ($9.38 per ton), and 58@62% rock, 6¾d. ($7.80 per ton). Algerian is sold ahead for a long time.

We quote: Florida high grade, 78@80% rock, $9.50@$10 per long ton f. o. b. Fernandina. The freight rate to New York is about $2 per ton. Florida land pebble, 68@73%, $7@$7.50 per ton, delivered in New York. Florida Peace River, rock, 58@63%, $4.50 per ton f. o. b. Punta Gorda. South Carolina crude rock, $4.25@$4.50; hot-air dried, $4.50@$5 per long ton f. o. b. Fetteressa, S. C. Tennessee, 78% rock, $4@$4.50 f. o. b. Mt. Pleasant, and 75% rock, $2.75@$3 f. o. b. High grade Tennessee rock, ex-vessel New York, $9 @$10 per ton. Hickman County blue-gray rock, 65%, and not over 3% iron and alumina, $2.50@ $2.75 per ton f. o. b. mines. Concentrated phosphates, 13@15% av. $P_2O_5$ 60c. per unit at sellers' works. Acid phosphates, $6.25 per ton for 14% in bulk, f. o. b. Charleston, S. C.

**Liverpool.** Dec. 13.

(Special Report of Joseph P. Brunner & Co.)

The strength of the market for heavy chemicals continues unimpaired and a considerable amount of business is reported for delivery during the early months of next year, also over all 1900. The Board of Trade returns for the month ending November 30th have been issued and show a marked increase in shipments as compared with the corresponding month of last year, the figures being as follows: Total exports to all quarters, alkali, 404,661 cwts.; bleaching powder, 140,327 cwts. Exports to United States alone, alkali, 114,234 cwts.; bleaching powder, 101,139 cwts. As compared with November, 1898, the increase is about as follows: Total exports to all quarters, alkali 22½%; bleaching powder, 26 1/3%. Exports to United States alone, alkali, 76¼%; bleaching powder, 52%.

From the above it will be seen that the shipments to America have been exceptionally heavy as compared with November, 1898, and exports to other quarters also show an improvement.

Soda ash is strong and little to be had for anything like prompt delivery. We quote spot range for tierces about as follows: Leblanc ash, 48%, £4 15s.@£5; 58%, £5@£5 5s. per ton net cash. Ammonia ash, 48%, £4 5s.@£4 10s.; 58%, £4 10s.@£4 15s. per ton net cash. Bags are 5s. per ton under price for tierces. Soda crystals are fully maintained at £3 2s. 6d. per ton, less 5% for barrels, or 7s. less for bags. Special quotations for a few favored markets. Caustic soda is practically unobtainable for prompt delivery, except for an odd parsel or two in second hands, and the position is very strong. Makers are also well sold over 1900 and a further advance in prices is talked of. We quote range for any position, about as follows: 60%, £8 5s.; 70%, £9 5s.; 74%, £9 15s.; 76N, £10@£10 5s. per ton net cash.

Bleaching powder is firm at £6 10s.@£6 15s. per ton net cash, for hardwood packages, and makers have little to offer.

Chlorate of potash is inquired for and firmer, 3½d. per lb. net cash being now minimum figure for 1900 delivery.

Bicarb. soda is selling at varying prices according to destination, ranging from £5 5s. to £6 15s. per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is a shade easier at about £11 10s.@£11 12s. 6d. per ton, less 2½% for good gray, 24@25% in double bags f. o. b. here.

Nitrate of soda keeps steady at £8@£8 2s. 6d. per ton, less 2½% for double bags f. o. b. here.

## MINING STOCKS.

Complete quotations will be found on pages 777 and 778 of mining stocks listed and dealt in at:

| | | |
|---|---|---|
| Boston. | Philadelphia. | London. |
| Colo. Springs. | Spokane. | Mexico. |
| Denver. | Salt Lake. | Paris. |
| New York. | San Francisco. | Toronto. |

**New York.** Dec. 22.

The panicky feeling on Wall Street on Monday, coupled with the financial distress in Boston, has had a demoralizing effect on stock speculation. Prominent among the heaviest sufferers were the industrial and trust stocks. Federal Steel common broke from $52 to $39¾ on Monday, with sales of 47,900 shares, and the preferred from $74½ to $70 with tradings in 17,000 shares on that day. Tennessee Coal and Iron, which sold at $125 last September, was precipitated to $64 on Monday on sales of 14,900 shares. American Steel and Wire common dropped from $38 to $32, and the preferred from $90 to $84, and Colorado Fuel and Iron from $41½ to $35¼. The prompt action of financial institutions in offering money at a reasonable rate resulted in a recovery in the stock market. In the copper group Amalgamated sold off 3½ points at $77, but later gained 2 points, changing hands at $79. Anaconda tumbled from $39½ to $31½ during the flurry, and at the close is selling around $36. Tennessee was bid down to $10 and later at $11¼, while holders seek $12. Whipsaw of Arizona is featureless at $12½@$13½, and Markeen at $6½@$7. British Columbia was softer at $9@ $10, while Arizona Lead is held for $10@$10⅜.

American Smelting and Refining common was weak, being bid down from $34 to $30, but sales were mostly effected between these figures. The preferred recovered on declaration of the regular quarterly dividend of 1¾%, selling up from $79 to $84. Of Sloss-Sheffield preferred a sale of 200 shares was made on curb at $67, and of Standard Oil transactions weakened the price from $459 to $448.

Homestake sold ex-dividend (50c. per share) at $74—just $2 better than last week. Ontario of Utah brought $8@$8.75, and Moulton of Montana, 30c.

In the Colorado section Isabella of Cripple Creek sold at $1.25. A 3c. dividend has been declared—2c. more than last September—and when distributed there will be $171,071 in the treasury. Mt. Rosa brought 50c., after paying a 4c. dividend out of the sale of the Mary Cashen property, leaving $73,000 in the treasury. Jack Pot sold at 59c. on announcement of a 6c. dividend from royalties received from lessees. Work is off 2c. at 29c. Mollie Gibson made sales at 20@ 22c., and Argentum-Juniata at 20@21c. Garfield Consolidated sold at 15½c.; Alamo and Cripple Creek Consolidated at 14c.; Findley at 12½c., and Leadville at 8½c.

In the Comstock class Consolidated California & Virginia gained 15c., selling at $1.60; Mexican declined 3c. to 30c.; Sierra Nevada Brought 50c.; Ophir, 85c., while Potosi, with a 10c. assessment just levied, sold at 15c., against 28@29c. last week.

At auction there was a sale of 200 common shares of Mahoning Coal Company at $180½; also 100 shares preferred Joseph Ladue Gold Mining and Development Company of Yukon at $1.50 per share—just $3 less than the last transactions. Even this price is above the actual value of the stock, as we have heretofore pointed out.

**Boston.** Dec. 21.

(From Our Special Correspondent.)

Last week's excitement over the Globe Bank troubles was followed by the failure of Squire & Co. and the closing of the Broadway Bank, with something approaching a collapse of the market for copper shares. The Amalgamated Company, or its backers, were forced to come to the rescue, and they are credited with buying some big blocks of Montana, Butte and a few other stocks. Just what they did is not certainly known, but it is sure that a lot of money was paid over and a good many shares changed hands. The effect was to quiet the market, but not to strengthen it much, and the drop in prices holds good to very near its full extent.

The greatest fall has been in the United States Oil group of stocks, and they have sold down pretty well. The Amalgamated group also show a drop. Amalgamated sold to-day at $78½; Boston & Montana, $273; Butten & Boston, $44½.

How the best stocks were pulled down is shown by a few quotations—and these are some recovery from the lowest to-day: Calumet & Hecla, $720; Tamarack, $180; Quincy, $135; Osceola, $69; Atlantic, $23.

Of course this is one phase of the reaction which I predicted some time ago. It had to come—it has been coming for some time—and it was only the incidents of the Globe Bank and very high rates for money which brought it this time and brought it so hard. It is a lesson; but I suppose the next time we shall have to learn it all over again.

At the low prices a good deal of business has been done, and sales have been larger than for several weeks past.

The stock of the Elm River Copper Company was listed on the Exchange this week. The company was organized April, 1899, and owns 2,300 acres of land in Houghton County, Mich. The capital stock is 100,000 shares, $12 par value. The office is in Jersey City, with transfer office 60 State street, Boston; register, Old Colony Trust Company. The directors are H. F. Fay, W. B. Mosman, John C. Watson, Stephen R. Dow and Charles N. King.

The stock and bonds of the New England Gas and Coke Company have been placed in the unlisted department of the Stock Exchange. The company has $17,500,000 stock, of which $16,000,000 are issued; $17,500,000 in 5% bonds, due in 1937, of which $16,000 are issued. The Central Trust Company, New York, is trustee under the mortgage. Transfer agents, American Loan and Trust Company, Boston, and United States Loan and Mortgage Company, New York; registers, Old Colony Trust Company, Boston, and Central Trust Company, New York. The directors are Henry M. Whitney, Robert W. Lord, Boston; Emerson McMillan, Alemric H. Paget, Stephen Peabody, H. F. Dimock, New York; Anthony N.

Brady, Robert C. Pruyn, Albany, N. Y.; W. L. Elkins, W. L. Elkins, Jr., Philadelphia; William Hines, Pittsburg.

**Salt Lake City.** Dec. 16.

(From Our Special Correspondent.)

Altogether this is a week of surprises in Utah mining shares, and they are neither cheering nor pleasant. The prime sensation is centered in Boston, and though Centennial-Eureka no longer is dealt in on the home exchange it is still a favorite with Salt Lake investors, as also are Utah Consolidated and other Utah shares affected by the upheaval of the Boston mining share market. Since Thursday Boston, so far as its relation to Utah mines goes, has almost entirely diverted attention from the home market, and the volume of business has fallen almost to the low-record mark.

Bullion-Beck passed the December dividend and the shares sag. Chloride Point scores a new low mark under the present regime. It is said the mill is more than making expenses. Daly-West is cutting queer antics. The shares drooped to $12.20 on Thursday, and that afternoon an extra Christmas dividend of $30,000, or 20c. a share, was declared, which caused a recovery to $12.70. After the books on the regular and extra dividends were closed the shares showed weakness, and to-day offerings are made at $12. Numerous rumors are afloat; one to the effect that the Haggin-Chambers coterie will take the helm at the approaching annual meeting, and that there will be a cessation of dividends till the treasury reserve overtops $300,000.

In spite of a change in Dexter management and more flattering reports from the mines, the shares fail to strengthen. Daisy swings between 12 and 14. The mill enlargement will be completed by New Year's. Eagle & Blue Bell is doing quite a little business, and the shares hold fairly firm. Geyser-Marion's November output was $10,000. Grand Central softened under $6. Lower Mammoth has another assessment of 5c. Mercur sells at $6.75. Northern Light was a good seller. There is nothing new from the mines. There is a quiet demand for Ontario, and the shares hold up well. South Swansea made a splendid recovery from the bear attack following the filing of Four Aces suit. Sunbeam has softened—a general surprise. An extra $50,000 dividend is declared by Silver King, payable December 20th.

**San Francisco.** Dec. 16.

(From Our Special Correspondent.)

The market showed but little animation this week, but quotations have been a little better. The business has been among insiders chiefly. The public having failed to be attracted by any of the new plans, apparently some of the old ones are to be brought forward again; but it seems a hopeless case as far as the Comstocks are concerned.

Some quotations noted are: Consolidated California & Virginia, $1.70@$1.75; Ophir, 88c.; Sierra Nevada, 57c.; Best & Belcher, 37c.

The ore-yield of the Consolidated California & Virginia was reported last week at 314 cars, This seems to show that an ore-body has really been opened, though it is not believed to be large.

The monthly statements of the financial condition of the mining companies on December 1st, 1899, sworn to by presidents and secretaries, were filed for the inspection of stockholders in the offices. The following companies report having had cash on hand on the above date, with all expenses paid, unless otherwise mentioned: Alpha Consolidated, $2,526; Alta Consolidated, $911; Andes, $3,373; Belcher, $1,560; Best & Belcher, $3,713; Bullion, $4,577; Caledonia, $3,731, with November expenses at the mine unpaid; Challenge Consolidated, $545; Consolidated New York, $17; Consolidated Imperial, $1,312; Crown Point, $7,225, with November expenses at the mine unpaid; Chollar, $3,062; Confidence, $3,249, with November mining expenses unpaid; Consolidated California & Virginia, $1,683; Exchequer, $89; Gould & Curry, $468, with $4,000 due the bank; Hale & Norcross, $6,006; Julia Consolidated, $672; Justice, $1,208; Mexican, $9,331; Ophir, $9,093; Overman, $3,818, with November mining expenses unpaid; Potosi, $2,426; Savage, $550; Seg. Belcher, $2,523; Silver Hill, $313; Sierra Nevada, $9,449; Standard Consolidated, $124,958, with November expenses and bullion yield to be accounted for; Syndicate, $1,677; Union Consolidated, $12,969; Utah Consolidated, $330.

On the Oil Exchange business has again been fairly active. Among the quotations noted are: Tidal Wave, $2.25; Anaconda, $1.30; Barker Ranch, $1.15; Century, $1.10; Caribou, 95c.@$1. On the Producers' Oil Exchange there were sales of Home at $375; while New Hope brought $1, and Dominion 40@45c. No new companies have been listed this week.

**London.** Dec. 6.

(From Our Special Correspondent.)

The South African mining market has been quite inactive this week. The prospects of a prolonged war increase daily and shareholders and speculators just allow things to go on as they are. The Boers are working some of the mines, but only to a limited extent, and I hear from reliable sources that they experience much difficulty in managing the plant. In fact, in some cases the owners before leaving Johannesburg made certain ingenious alterations in the plant, for this very purpose. As most of the practical mechanics have left the Rand, there is no one to put the machinery into working order. It would thus appear that under Boer management the output will be even smaller than was expected.

In other sections of the market considerable dullness is the rule. West Australians have fallen several points, chiefly because the public are afraid that the sulphides are becoming more difficult to treat, and that the leading producers will report smaller outputs in consequence. I believe, however, that the managers and metallurgists are quite equal to the solution of the sulphide problem of the Kalgoorlie District. This problem of treating the sulphides of West Australia is very much exaggerated in London, and its nature is not at all understood. The difficulty arises entirely from the fact that the gold-fields are metallurgically isolated and that there is no practicable means of selling the sulphides to copper or lead smelters. Consequently different methods of treatment have to be devised, and it is not surprising that, in many cases, where the manager's inventiveness is not very great, the percentage of extraction is comparatively low. The basis of treatment in this district is now becoming more fixed and within a short time we should cease to hear of difficulties of treatment. Anyhow, there is no cause for such depression in the share market as we have experienced this week.

A Canadian mining proposition has been introduced to the London public this week. This is the Sultana Mine of Canada, Limited. Though the directors tell the public that they do not ask for subscriptions, yet the prospectus is freely enough circulated and I do not think that any one will ask without receiving. The property to be acquired is the Sultana Mine, situated on Sultana Island in the Lake of the Woods, 7 miles from Rat Portage. This mine has been known as a producer for some time, and the average ore contents is $15 per ton. It is also well equipped with mining and metallurgical plant. The prospectus gives extracts from the Government reports on the mine and Mr. W. E. Strong, the company's manager, also gives full information and details. Mr. John F. Caldwell of Winnipeg is the vendor, and he has secured an influential board, though no doubt he and Mr. Strong will continue to be practically the managers. The capital of the company is £275,000, of which £225,000 in shares is purchase price and £50,000 is to be devoted to working capital. There is no information available here to enable me to judge as to the relative value of the mine and its capitalization, but no doubt some of your readers will be able to supply you with this information.

**Paris.** Dec. 10.

(From Our Special Correspondent.)

The stock markets have been uneven and somewhat excited. The South African gold shares have received much attention, and are generally weak. The copper stocks are also rather weak. The metallurgical shares remain the strong point.

The new Panama Canal Company has issued a report showing expenditures last year of 28,537,298fr. The report says that the construction of the canal with locks can be completed in 10 years, at a cost of 512,000,000fr.

A deputation from the French Association of Ironfounders was received this week by the Minister of Commerce to protest against any reduction in the customs duty on iron in the proposed Franco-American treaty of commerce. The deputation pointed out that, even with the present maximum tariff, American competition was causing great injury to French iron makers.

The gold and silver movement in France is reported by the Ministry of Commerce as below for the 10 months ending October 31st:

| | Imports. Francs. | Exports. Francs. | | Excess. Francs. |
|---|---|---|---|---|
| Gold: | | | | |
| 1899 | 277,764,960 | 109,480,102 | Imp. | 168,284,858 |
| 1898 | 165,079,098 | 275,138,536 | Exp. | 110,059,438 |
| 1897 | 236,420,723 | 89,216,632 | Imp. | 147,204,091 |
| Silver: | | | | |
| 1899 | 160,873,752 | 264,124,756 | Exp. | 103,251,004 |
| 1898 | 157,005,989 | 145,485,921 | Imp. | 11,520,068 |
| 1897 | 134,568,064 | 140,431,497 | Imp. | 5,863,433 |

Imports of bronze and nickel coins, rated at their face or coinage value, were 64,800fr., against 71,000fr. in 1898, and 80,100 fr. in 1897. Exports were 1,408,500fr., against 488,700fr. in 1898 and 2,727,900fr. in 1897.

I need hardly say that the condition of affairs in South Africa gives unlimited satisfaction to a certain party here; but most financiers regard it with much anxiety. Azote.

## DIVIDENDS.

American Gold Mining Company, of Colorado, 4c., per share, payable immediately.

Argonaut Mining Company, of California, $20,000, payable December 26th.

Bunker Hill & Sullivan Mining and Concentrating Company of Idaho, paid $33,000 on December 18th, making $201,000 distributed this year, and $801,000 to date.

Boston-Aurora Zinc Mining Company, Missouri, preferred stock, $5,328, payable December 26th.

California quicksilver dividends payable January 1st, 1900, are: Aetna Consolidated, 15c. per share ($15,000); Boston, 10c. ($10,000); Napa Consolidated, 20c. ($20,000); New Idria, 20c. ($20,000).

Consolidated Gold Mines Company, of Colorado, paid 1c. per share ($10,000) on December 23d.

Deer Trail No. 2 Mining Company, Washington, $2,500, December 26th.

Dominion Coal Company of Nova Scotia, semi-annual of 4% on the preferred, payable January 1st.

Daly-West Mining Company, Utah, paid 40c. per share ($60,000) on December 20th.

Empire Steel and Iron Company 3% on preferred stock, January 2d.

Girard Trust, of Philadelphia, 8% and a special of 2%, payable January 2d.

Gold Coin Mining Company, Cripple Creek, Colorado, 10c. ($100,000), December 26th.

Homestake Mining Company, of South Dakota, regular monthly of 25c. and extra of 25c. ($105,000), payable December 26th.

Isabella Gold Mining Company, of Cripple Creek, 3c. per share ($67,500), paid December 20th. Total to date, $540,000.

Jack Pot Mining Company, of Cripple Creek, Colo., paid 6c. per share ($75,000) on December 23d. Total to date, $150,000.

Mt. Rosa Mining, Leasing and Land Company, of Cripple Creek, Colo., 4c. per share ($40,000), paid December 23d.

New Haven Iron and Steel Company, 20c. per share for 2 months, payable December 30th.

Silver King Mining Company, of Utah, paid 33⅓c. per share on December 23d.

St. Joseph Lead Company, Missouri, paid the regular quarterly $37,500 on December 20th.

Susquehanna Iron and Steel Company, of Philadelphia, quarterly of 6%, payable December 30th.

United States Oil, regular quarterly 75c. and extra of 50c., payable January 1st.

## MEETINGS.

| Name of Company. | State. | Meeting. | Date. | Place of Meeting. |
|---|---|---|---|---|
| Alice | Mont. | Annual. | Jan. 11. | Salt Lake City. |
| American Coal | " | | Dec. 29 | Broadway, N.Y. |
| Blue Bird | Utah | " | Jan. 2 | Walker Bk Bldg, Salt Lake City. |
| Boston & Tintic | Utah. | " | Jan. 9. | Central Blk, Salt Lake City. |
| Hale & Norcross | Nev. | " | Dec 26 | S. Francisco, Cal. |
| Isabella | Colo | " | Jan. 16. | Color'do Springs, Colo |
| Joe Bowers | Utah. | Special. | Jan. 3. | Salt Lake City. |
| Kennedy | Cal. | Annual. | Dec. 28. | 404 Montgomery st. S. Fr'ncisco. |
| Mt. Rosa | Colo | " | Jan. 9. | Color'do Springs, Colo. |
| Mercer | Utah. | " | Jan. 12. | Salt Lake City. |
| Valeo | Utah. | " | Jan. 18. | Salt Lake City. |

## ASSESSMENTS.

| Name of Company. | Location. | Amt. | Dlq. | Sale. | Amt. |
|---|---|---|---|---|---|
| Arrastraville | Cal. | 4 | Dec. 11 | Jan. 3 | .10 |
| Brigham City Cop.&S. | Utah | 1 | Jan. 13 | Feb. 1 | .00½ |
| Brunswick Con | Cal. | 13 | Dec. 19 | Jan. 17 | .03 |
| Bunker Hill | Utah | ... | Dec. 23 | ..... | .01 |
| Challenge Con | Nev. | 28 | Jan. 11 | Feb. 1 | .10 |
| Chollar | Nev. | 5 | Jan. 11 | Jan. 31 | .10 |
| Con. New York | Nev | 16 | Jan. 4 | Jan. 25 | .03 |
| Eureka Con | Cal. | 22 | Jan. 6 | Jan. 27 | .00½ |
| Four Aces | Utah | ... | Jan. 1 | ..... | .05 |
| Gould & Curry | Nev. | 88 | Dec. 27 | Jan. 18 | .15 |
| Grape Vine Canyon | Cal. | 1 | Jan. 8 | Jan 29 | .10 |
| Jennie Lind | Cal. | ... | Jan. 15 | ..... | .01 |
| Joe Bowers Ext | Utah | 4 | Dec. 10 | Dec. 30 | .01 |
| Little Pittsburg | Utah | ... | Dec. 23 | ..... | .00½ |
| Lower Mammoth | Utah | ... | Dec. 15 | ..... | .05 |
| Martha Washington | Utah | 3 | Jan. 4 | Jan. 25 | .01 |
| Meteor | Utah | ... | Dec. 18 | Jan. 22 | .00½ |
| New Imperial | Utah | 1 | Jan. 2 | Jan. 20 | .01 |
| Occidental | Nev. | 34 | Jan. 3 | Jan. 24 | .05 |
| Opohongo | Utah | 3 | Dec. 14 | Jan. 4 | .01 |
| Potosi | Nev. | 54 | Jan. 16 | Feb. 7 | .15 |
| Reward | Cal. | ... | Jan. 6 | ..... | .02½ |
| Savage | Nev. | 95 | Jan. 10 | Jan. 30 | .10 |
| Sierra Nevada | Nev. | 117 | Dec. 7 | Dec. 26 | .15 |
| Thorpe | Cal | .. | Jan. 2 | ..... | .01 |
| Tuscarora Chief | Utah | ... | Dec. 23 | ..... | .02 |
| Yankee Con | Utah | 1 | Jan. 12 | Feb. 12 | .01 |
| Yellow Jacket | Nev. | 2 | Dec. 26 | Jan. 31 | .15 |

# STOCK QUOTATIONS.

## NEW YORK.

| NAME OF COMPANY | Location. | Par val. | Dec. 15. H. | Dec. 15. L. | Dec. 16. H. | Dec. 16. L. | Dec. 18. H. | Dec. 18. L. | Dec. 19. H. | Dec. 19. L. | Dec 20. H. | Dec 20. L. | Dec. 21 H. | Dec. 21 L. | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adams | Colo | $10 | 10 | .... | .10 | .... | .08 | .... | .... | .... | .14 | .... | .... | .... | .... |
| Alamo | " | 1 | .15 | .... | .13½ | .... | .14 | .... | .13 | .... | .14 | .... | .... | .... | 1,500 |
| Ailce | " | 25 | .4 | .... | .36 | .... | .33 | .... | .38 | .... | .38 | .... | .... | .... | .. |
| Ama'gamated C | Mont. | 10 | 81.25 | 81.00 | 79 63 | 79.38 | 79 50 | 79.00 | 79.75 | 78 50 | 78.5 | 78.0 | 81.50 | 81.25 | .... |
| Anaconda, c | " | 25 | 40.75 | 39 50 | 39.50 | 38.0 | 37 63 | 1.50 | 37.0 | 32.50 | 36.00 | 35 13 | 35.50 | .... | 20,930 |
| Anaconda Gold | Colo.. | 5 | .41 | .... | .44 | .... | .44 | .... | .37 | .... | .37 | .... | .43 | .40 | 1,700 |
| Anchoria Lei . | " | 1 | .74 | .... | .74 | .... | .74 | .... | .75 | .... | .75 | .... | .... | .... | .... |
| Argentum-Jun.. | " | 2 | .20 | .... | .15 | .... | .19 | .... | .20 | .... | .21 | .... | .... | .... | 1,100 |
| Belcher | Nev... | 3 | .15 | .... | .15 | .... | .15 | .... | .15 | .... | .... | .... | .... | .... | .... |
| Best & Belcher | " | 3 | .30 | .... | .22 | .... | .30 | .... | .27 | .... | .25 | .... | .... | .... | .... |
| Breece | Colo.. | 25 | 1 90 | .... | 1.85 | .... | 1.60 | .... | 1.75 | .... | 1.90 | .... | .... | .... | .... |
| Brit.Col.Copper | B. C.. | 10 | 11 00 | 10.00 | 11.13 | 9.75 | 9.50 | .... | 10.00 | 9 00 | 10.00 | 9.00 | 10 00 | 9.25 | .... |
| Brunswick | Cal... | 1 | 24 | .... | 20 | .... | .2. | .... | .14 | .... | .28 | .... | .... | .... | .... |
| Catalpa | .... | .... | .... | .... | .15 | .... | .15 | .... | .... | .... | .15 | .... | .... | .... | .... |
| Cholar | Nev... | 3 | .16 | .... | .12 | .... | .12 | .... | .12 | .... | .12 | .... | .... | .... | .... |
| Comst'k T , st's | " | 100 | .04 | .... | .03⅜ | .... | .04 | .... | .03 | .... | .03 | .... | .... | .... | .... |
| " " bon's | " | 100 | .03 | .... | .03 | .... | .... | .... | .03 | .... | .03 | .... | .... | .... | .... |
| " " scrip | " | 100 | .06 | .... | .06 | .... | .06 | .... | .03 | .... | .03 | .... | .... | .... | .... |
| Con. Cal. Va | " | 2½ | 1.80 | .... | 1.60 | .... | 1.55 | .... | 1.45 | .... | 1.60 | 1.50 | .... | .... | 1,250 |
| Cr & Cr. Creek | Colo.. | 1 | .08 | .... | .09 | .... | .09 | .... | .08 | .... | .08 | .... | .... | .... | 4,000 |
| Crescent | " | 10 | .... | .... | .12 | .... | .10 | .... | .12 | .... | .15 | .... | .... | .... | .... |
| Cripple Cr. Con. | " | 1 | .14 | .... | .43⅜ | .... | .15 | .... | .14 | .... | .15 | .... | .... | .... | 1,000 |
| Crown Point | Nev.. | 3 | .12 | .... | .14 | .... | .14 | .... | .12 | .... | .10 | .... | .... | .... | .... |
| Damon | Colo.. | 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Deadw'd Terra | S.Dak | 25 | .50 | .... | .50 | .... | .45 | .... | .50 | .... | .50 | .... | .... | .... | .... |
| Dunkin | Colo | 1 | .08 | .... | .08 | .... | .08 | .... | .10 | .... | .08 | .... | .... | .... | .... |
| Elkton | Colo.. | 1 | .... | .... | 1.16 | .... | 1.16 | .... | 1.125 | .... | 1.155 | .... | 1.20 | 1.15 | 1,500 |
| Eureka | Nev... | 20 | .25 | .... | .8 | .... | .20 | .... | .25 | .... | .20 | .... | .... | .... | .... |
| Father de Smet | Dak... | 100 | .08 | .... | .08 | .... | .08 | .... | .08 | .... | .08 | .... | .... | .... | 1,000 |
| Findley | Colo | 1 | .12⅜ | .... | .15 | .... | .13 | .... | .14 | .... | .12½ | .... | .... | .... | 1,000 |
| Garf Con | " | 1 | .19 | .... | .19 | .... | .19⅜ | .... | .17 | .... | .15⅜ | .... | .... | .... | 1,000 |
| Golden Age | " | 1 | .... | .... | .03½ | .... | .0 ⅜ | .... | .... | .... | .... | .... | .... | .... | 2,0.0 |
| Golden Fleece.. | " | 1 | .28 | .... | .27 | .... | .26 | .... | .26 | .... | .24 | .... | .30 | .25 | 1,000 |
| Gould & Curry | Nev .. | 3 | .14 | .... | .10 | .... | .10 | .... | .09 | .... | .10 | .... | .... | .... | 410 |
| Hale&Norcross | Nev .. | 3 | .32 | .... | .33 | .... | .32 | .... | .31 | .... | .33 | .... | .... | .... | 260 |
| Homestake | S.Dak | 100 | 65.00 | .... | 65.00 | .... | 65.00 | .... | 65.00 | .... | 74.00 | .... | .... | .... | 10 |
| Horn Silver | Utah.. | 25 | 1.00 | .... | 1.00 | .... | 1.00 | .... | 1.00 | .... | 1.00 | .... | .... | .... | .... |
| Iron Silver.. | Colo. | 20 | .52 | .... | .52 | .... | .52 | .... | .50 | .... | .50 | .... | .... | .... | .... |
| Isabella | " | 1 | 1.25 | .... | 1 35 | .... | 1.25 | .... | 1.25 | .... | 1.39½ | .... | .... | .... | 1,400 |
| Jack Pot | .... | 1 | .... | .... | .62 | .... | .59 | .... | .57 | .... | .55 | .... | .... | .... | 300 |
| King & Pemb.. | Ont.. | 10 | .40 | .... | .40 | .... | .40 | .... | .38 | .... | .38 | .... | .... | .... | .... |
| Lacrosse | Colo.. | 10 | .16 | .... | .16 | .... | .6 | .... | .16 | .... | .16 | .... | .... | .... | .... |
| Leadville Con | " | 10 | .07 | .... | .07 | .... | .06 | .... | 06½ | .... | .07 | .... | .... | .... | 100 |
| Little Chief | " | 50 | 17 | .... | .17 | .... | .17 | .... | .17 | .... | .17 | .... | .... | .... | .... |
| Mexican | Nev... | 3 | .40 | .... | .38 | .... | .38 | .... | .30 | .... | .30 | .... | .... | .... | 500 |
| Mollie Gibson.. | Colo.. | 5 | .23 | .... | .24 | .... | .20 | .... | .20 | .... | .22 | .... | .22 | .2 | 2,700 |
| Morenci Cop .pf | " | 1 | .... | .... | 1.75 | .... | .... | .... | 1.75 | .... | 1.75 | .... | 1.752 | 1.75 | 1,000 |
| Moulton | Mont. | 25 | .85 | .... | .35 | .... | .20 | .... | .30 | .... | .30 | .... | .... | .... | 100 |
| Mt. Rosa | Colo.. | 1 | 54½ | .... | .48 | .... | .39 | .... | .50 | .... | .50 | .... | .... | .... | 1,200 |
| Occidental | Nev.. | 3 | .10 | .... | .10 | .... | .10 | .... | .10 | .... | .10 | .... | .... | .... | .... |
| Ontario | Utah | 100 | 7.50 | .... | 8 00 | .... | 7.50 | .... | 8.00 | .... | 8.75 | .... | .... | .... | 110 |
| Ophir | Nev .. | 3 | .90 | .... | .90 | .... | .... | .... | .85 | .... | .70 | .... | .... | .... | 200 |
| Pinnacle | Colo.. | 1 | .... | .... | .27 | .... | .28 | .... | .28 | .... | .... | .... | .... | .... | .... |
| Pharmacist | " | 1 | .12 | .... | .06 | .... | .06 | .... | .06 | .... | .06 | .... | .... | .... | .... |
| Phoenix | Aris.. | 1 | .10 | .... | .... | .... | .09 | .... | .13 | .... | .10 | .... | .... | .... | 1,000 |
| Plymouth Con.. | Cal.. | 10 | .08 | .... | .08 | .... | .05 | .... | .08 | .... | .08 | .... | .... | .... | .... |
| Portland | Colo.. | 1 | .92 | .... | 2.25 | .... | 2.25 | .... | 2.20 | .... | 2.20 | .... | .... | .... | 300 |
| Potosi | Nev... | 3 | .15 | .... | .21 | .... | .15 | .... | .13 | .... | .15 | .... | .... | .... | 6.0 |
| Quicksilver | Cal.. | 100 | 1.50 | .... | 1.50 | .... | 1.35 | .... | 1 85 | .... | 2.00 | .... | .... | .... | 100 |
| do. pref | " | 100 | 7 50 | .... | 7.25 | .... | 7.00 | .... | 7.00 | .... | 7.50 | .... | .... | .... | .... |
| Savage | Nev.. | 2½ | 80 | .... | .03 | .... | .08 | .... | .06 | .... | .05 | .... | .... | .... | .... |
| Sierra Nevada | " | 3 | .35 | .... | .45 | .... | .42 | .... | .40 | .... | .50 | .... | .... | .... | 600 |
| Small Hopes | Colo.. | 20 | .91 | .... | .95 | .... | .90 | .... | .90 | .... | .... | .... | .... | .... | .... |
| Specimen | " | 1 | 09 | .... | .09 | .... | .09 | .... | .... | .... | .08 | .... | .... | .... | .... |
| Standard Con.. | Cal .. | 1 | 2.65 | .... | 2 80 | .... | 2.50 | .... | 2.60 | .... | 2 25 | .... | .... | .... | 100 |
| Tenn Copper.. | Tenn. | 11 | 12 00 | 10.63 | 12.00 | 10.63 | 12.00 | 10.00 | 12 00 | 11 25 | 12.00 | 10.00 | 12.00 | 10.50 | .. .. |
| Tornado | Colo.. | 1 | .... | .... | .44 | .... | .... | .... | .44 | .... | .41 | .... | .... | .... | .... |
| Union | " | 1 | .33 | .... | .35 | .... | .34 | .... | .32 | .... | .33 | .... | .35 | .34 | 1,400 |
| Union Con | Nev.. | 2½ | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Utah Con | " | 5 | .04 | .... | .04 | .... | .05 | .... | .03 | .... | .03 | .... | .... | .... | .... |
| Work | Colo | 1 | .3. | .... | .28 | .... | .27 | .... | .28½ | .... | .29 | .... | .30 | .28¾ | 3,500 |
| Yellow Jacket | Nev .. | 8 | 10 | .... | .15 | .... | .10 | .... | .6 | .... | .13 | .... | .... | .... | 1,000 |

## COAL AND INDUSTRIAL STOCKS.

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am. Sm. & Ref. | ..... | $100 | 35⅞ | 34½ | 35 | 34½ | 34 | .. | 33 | 32 | 34 | 33½ | 31 | .... | 11,54 |
| " " pf | ..... | 100 | 86¾ | 86 | 86 | 85 | 85 | 77¾ | 85 | 79 | 83¾ | 84 | 91 | .... | 11,144 |
| Am.S &W Co n | ..... | 100 | 33¾ | 35¾ | 33¾ | 37 | 33 | 32 | 37¾ | 34 | 43¾ | 38¼ | 40¾ | .... | 18288 |
| " " pf'r n | ..... | 100 | *9 ¾ | 89¾ | .... | .... | 90 | 85 | 88 | 84¾ | 91 | 87¾ | 89¾ | .... | 11,0 9 |
| Central of N. J. | N. J. | 100 | 117⅜ | 115 | 116 | .... | 115¼ | 113 | 115¾ | 113 | 114 | 112¾ | 111¾ | .... | 146300 |
| Col. C. & I. Dev | Colo.. | 100 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Col. Fuel & I.. | Colo.. | 100 | 44¼ | 42¾ | 43¾ | 41¾ | 41¾ | 35¾ | 38¾ | 36 | 40 | 37¾ | 37 | .. | 24,430 |
| Col. & H.C.&I. | Ohio.. | 100 | 15¾ | 15¼ | .... | .... | 14¾ | 13 | 13 | 12¾ | .... | .... | .... | .... | 93 |
| Del. & Hud | N. Y. | 100 | 116¼ | 115¾ | 115¾ | 115 | 115 | 111¾ | 115¾ | 110¾ | 114¾ | 118 | 118 | .... | 15, 100 |
| Federal Steel.. | .... | 100 | 51¼ | 52¾ | 53⅜ | 51¾ | 52 | 39¾ | 47¾ | 42¾ | 47¾ | 41¾ | 44¾ | .... | 165183 |
| " " pf | .... | 100 | 76⅜ | 75 | 76¼ | 73¾ | 74½ | 70 | 73¾ | 69¼ | 71 | .... | 70 | .... | 30,832 |
| National Lead. | N. Y. | 100 | 26½ | 25¾ | 26¾ | 25 | 26 | 23 | 24¼ | 23 | 24¾ | 24¼ | 23¾ | .... | 5,340 |
| " " pf | Md... | 100 | .... | .... | .... | .... | .... | .... | 103¾ | 103 | 103¾ | 102¾ | 105 | .... | 4.6 |
| National Salt.. | .... | 100 | 45 | 43 | 45 | 43 | 44 | 42 | 43 | 42 | 43 | 42 | 44 | 41¾ | .... |
| " " pf | .... | 100 | 79 | 77 | 79 | 77 | 78 | 73¾ | 77 | 75 | 77 | .... | 78 | 75 | .... |
| N. Y., Ont. & W. | N. Y.. | 100 | 24¼ | 23¾ | 24¾ | 23 | 23¾ | 21¾ | 20¾ | 21¾ | 21¾ | 21 | 21 | .... | 38,991 |
| Reading, 1st pf. | Pa.... | 100 | 54¾ | 53¾ | 54 | 52 | 52 | 46 | 49 | 47¾ | 49 | 47¾ | 46¾ | .... | 58,955 |
| " 2d pf. | " .... | 100 | 28¾ | 28¾ | 28¾ | 28 | 28 | 24 | 25¾ | 24 | 26 | 25 | 24 | .... | 19,335 |
| Republic I & S. | .... | 100 | 20¾ | 19¾ | 19¼ | 19 | 18¾ | 16¾ | 18¾ | 16¼ | 19 | 18 | 18 | .... | 14,.05 |
| " " pf | .... | 100 | *85 | 64¾ | 64½ | 64 | 63 | 62 | 62 | 60¾ | 64 | 62¼ | 62 | .... | 4,217 |
| *Stan.Oil of N. J. | N.J.... | 10 | 461 | 457 | 460 | 456 | 454 | .... | 451 | 448 | 462 | 450 | 4?4 | 451 | .... |
| Tenn C..I.&R.R. | Ala.. | 100 | 85⅜ | 83 | 83 | 80 | 8 | 64 | 79 | 70¾ | 80¾ | 75 | 75¾ | .... | 52,5?0 |

* Ex-dividend.

## PHILADELPHIA, PA.

| NAME OF COMPANY. | L'cation. | Par Val. | Dec. 14. H. | Dec. 14. L. | Dec 15. H. | Dec 15. L. | Dec. 16. H. | Dec. 16. L. | Dec. 18. H. | Dec. 18. L. | Dec. 19. H. | Dec. 19. L. | Dec. 20. H. | Dec. 20. L. | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Am. Alkali | ..... | ..... | 2 88 | .... | 2.88 | .... | 2.75 | .... | 2.75 | .... | 2.75 | 2 50 | 2 75 | 2 50 | 3,015 |
| " " pf. | ..... | ..... | 1.38 | 1.00 | 1.25 | .... | 1.25 | .... | .... | .... | .... | .... | 1.25 | .... | 6 5 |
| Bethlehem Irn | Pa. | ..... | .... | .... | .... | .... | 58.00 | .... | .... | .... | 58.00 | .... | 58.50 | 57 88 | 297 |
| Bethlehem St'l | " | $50 | 7.50 | .... | 17.75 | 17.50 | .... | .... | 16.00 | 15.75 | 16.0 | 16.00 | 7 25 | 17 00 | 2,425 |
| Cambria Iron | " | 50 | 44 25 | 44. 0 | .... | .... | 44.00 | .... | 44.00 | .... | 43 00 | .... | 43 00 | .... | 5?6 |
| Cambria Steel | I.T. | 50 | 20.2 | 19.75 | 20.25 | 19 88 | 20.00 | .... | 19 63 | 18.00 | 18 00 | 16 0 | 8.88 | 18.0 | 29,987 |
| Choctaw. Pref. | Pa. | 50 | 43.00 | 42.88 | 43 00 | 42.50 | 44 7 | 43.50 | .... | .... | 42.00 | 41 00 | 42.00 | 41 50 | 1,.61 |
| Lehigh Val | " | 50 | 25 00 | 24 50 | 24.88 | 24 50 | 25 2 | 24.7 | 25.00 | 23.38 | 25 0 | 24.50 | 24.7 | 2 5 | 12,9?1 |
| Penna. R. R. | " | 50 | 66 25 | 65 63 | 66 75 | 65.88 | 66. 0 | 65 75 | 65 75 | 64.0 | 65.0 | 64.13 | 65.38 | 64.88 | 5,590 |
| Susq I & S. | " | ..... | 4 75 | 4.63 | 5.00 | 4.75 | 4 75 | .... | 4 75 | 4.25 | 4 13 | 3.75 | 5.00 | 4.25 | 5,363 |
| United Gas I . | " | 50 | 156¾ | 155 | 158¾ | 153¾ | 158 | 156 | 155 | 144 | 1.47 | 1.44 | 149¾ | 146¾ | 10,212 |
| Welsb. of Can | Can. | 100 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 1.88 | .... | 50 |
| Welsb. Comi.. | " | 100 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Welsb Light. | " | 100 | 45.0 | 44 00 | .... | .... | .... | .... | .... | .... | 41 0 | 38.0 | 41.0 | 36.00 | 855 |

Total shares sold, 76,.. 9.

## SALT LAKE CITY, UTAH.* Dec. 16.

| STOCKS.† | No of shares | Par val. | Bid. | Asked. | STOCKS.† | No of shares. | Par val. | Bid. | Asked |
|---|---|---|---|---|---|---|---|---|---|
| Ajax | 300,000 | $10 | $0 45 | $0.90 | Homestake | 400,000 | $1 | $0.08¼ | $0 12 |
| Alice | 400,000 | 25 | 30 | .50 | Horn Silver | 400,000 | 25 | .90 | 1.35 |
| Anchor | 150,000 | 10 | .... | .... | Joe Bowers | 400,000 | 1 | .15¾ | .1?¾ |
| Buckeye | 500,000 | 1 | .02¾ | .03¾ | Little Pittsburg | 400,000 | 5 | .05¾ | .0?¾ |
| Bullion-Beck & Ch. | 100,000 | 10 | 3.10 | 3.77 | Lower Mammoth | 150,000 | 1 | .45¾ | .48¾ |
| Centennial Eureka | 30,000 | 50 | .... | .... | Mammoth | 400,000 | 5 | 2 90 | 2.95¾ |
| Caloride Point. | 800,000 | 1 | .12 | .1?¾ | Mercur | 200,000 | 25 | 6 60 | 6.?5¾ |
| Daisy | 500,000 | 3 | .13 | .13¾ | Northern Light | 400,000 | 5 | 15¾ | .16¾ |
| Dalton | 500,000 | 5 | .... | .... | Omaha | 300,000 | 2 | .04 | .... |
| Dalton & Lark | 2,500,000 | 1 | .04¾ | .05¾ | Ontario | 150,000 | 100 | 8.51 | 9 18 |
| Daly | 150,000 | 20 | 1.70 | 1.76 | Richmond-An. | 500,000 | 1 | .... | .... |
| Daly West | 150,000 | 20 | 11 85 | 12 00 | Sacramento | 1,000,000 | 5 | 29¼ | 29¾ |
| Dexter | 300,000 | 5 | 2.12 | 2.28 | Silver King | 150,000 | 20 | 51 00 | 55.00 |
| Eagle | 150,000 | 1 | .... | .... | Star Consolidat'd | 500,000 | 1 | .23¾ | .24¾ |
| Eagle & Blue Bell | 250,000 | 1 | 1 43¾ | 1.45¾ | Sunbeam | 250,000 | 1 | .54¾ | 55 |
| Emerald | 300,000 | 1 | .... | .... | Sunshine | 250,000 | 10 | 16¾ | .28 |
| Four Aces | 250,000 | 1 | .05¾ | .08 | Swansea | 100,000 | 5 | 3 55 | 3 90 |
| Galena | 100,000 | 10 | .26 | .34¾ | South Swansea | 150,000 | 1 | 1.23 | 1 29 |
| Geyser-Marion | 300,000 | 5 | 31 | .27 | Utah | 300,000 | 1 | .... | .80 |
| Grand Central | 250,000 | 1 | 5 95 | 5 98 | Valeo | 300,000 | 10 | .60 | .70 |

*From Our Special Correspondent. † Utah companies. ‡ Mines in Vanderbilt, Cal. Mines in Tuscarora, Nev.

## BOSTON, MASS.†

| NAME OF COMPANY. | Par val. | No. of shares. | Dec. 14. H. | Dec. 14. L. | Dec 15. H. | Dec 15. L. | Dec. 16. H. | Dec. 16. L. | Dec. 18. H. | Dec. 18. L. | Dec. 19. H. | Dec. 19. L. | Dec. 20. H. | Dec. 20. L. | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Astna, cons. g. | $5 | 100,000 | .... | .... | .... | .... | .... | .... | .... | .... | 4.25 | .... | .... | .... | 100 |
| Adven'u'e,Cons | 25 | 100 000 | .... | .... | 6.00 | .... | 6.00 | 5 00 | .... | .... | .... | .... | 6.50 | .... | 180 |
| Allouez | 25 | 80,000 | .... | .... | .... | .... | 8.50 | 3.50 | 8.00 | .... | .... | .... | .... | .... | 100 |
| * m. Z. L. & S. | 25 | 1,200,000 | .... | .... | 30.00 | 19.00 | .... | .... | 30.00 | 13.00 | 17 00 | 16.00 | 30.00 | 16.00 | 8,?30 |
| Anaconda | 25 | 1,?0,000 | .... | .... | .... | .... | .... | .... | .... | .... | 34 00 | .... | .... | .... | 25 |
| Arcadian, c | 25 | 150,000 | 20.50 | 18.00 | 25.00 | 20.00 | 22.50 | 21.50 | 23 00 | 21 00 | 24.00 | 21 25 | 24.50 | 23.00 | 4,700 |
| Arnold, c | 25 | 60,000 | 6.00 | .... | 5 50 | .... | 4.00 | .... | 5 00 | 4 00 | 5.00 | 4.50 | 5.50 | 5.00 | 2,?35 |
| Ashbed | 25 | 40,0.0 | .50 | .... | .... | .... | 1.00 | .... | .... | .... | .... | .... | .... | .... | 25 |
| Atlantic, c | 25 | 40,000 | 3.00 | 21.00 | .... | .... | 23.00 | 20 00 | 21.00 | .... | .... | .... | 23 00 | .... | 690 |
| Baltic, c | 25 | 100,000 | 20 0. | .... | 21 00 | 20.00 | 20.00 | 8.00 | 20.00 | 18 00 | 19.50 | 15 00 | 18.0 | .... | 1,547 |
| Bin, ham, c.&g. | 10 | 190,0.0 | 11.00 | 10 00 | 12.00 | 10.00 | .... | .... | 10.50 | 9.00 | 10.00 | 9.00 | 10 5 | 10.00 | 2,576 |
| Bonanza, g | 10 | 300,000 | 1.13 | 1.00 | 1.00 | .... | .... | .... | 1.18 | 1.00 | 1.18 | 1 00 | 1.13 | 1 00 | 4,675 |
| Boston, q | 10 | 100,000 | .... | .... | .... | .... | .... | .... | .... | .... | 6.00 | .... | 6.00 | .... | 200 |
| Boston&C C | 10 | 200,000 | .... | .... | .... | .... | .20 | .... | .... | .... | .... | .... | .... | .... | .... |
| Hos.&Mon,Tr R | 25 | 150,000 | 265 | 250 | 265 | 265 | 264 | 250 | 270 | 255 | 267 | 250 | 275 | 261 | 4,529 |
| Breece | 25 | 20 ,000 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 100 |
| British Col.. | 5 | 200,000 | .... | .... | 10 00 | .... | .... | .... | .... | .... | .... | .... | 11 00 | .... | 200 |
| Butte & Bost., c | 10 | 200,000 | 45.00 | 38.00 | 42.00 | 42.00 | 45.00 | 42.00 | 45 00 | 40.00 | 44.00 | 41.00 | 45 00 | 42.00 | 5,167 |
| Cal. & Hecla, c. | 25 | 100,000 | 730 | 7.0 | 730 | 725 | 725 | .... | 725 | .... | 720 | 710 | .... | 720 | 156 |
| Centennial, c. | 25 | 90,000 | 19 00 | 18.00 | 19 00 | 18 75 | 15.50 | 14.75 | 18 00 | 14.00 | 17 00 | 15.00 | 17 50 | 16 00 | 4,240 |
| Central Oil | 25 | 59,720 | 19.50 | 18 50 | 19.25 | 19.0. | .... | .... | 19 00 | 7 75 | 18.7. | 17.50 | 19 00 | 18 50 | 3,140 |
| Cochito g | 10 | 150,000 | 12.50 | .... | 12.75 | 12.00 | .... | .... | 12 00 | 10.00 | 12.50 | 10.00 | 12.75 | 12.50 | 6,440 |
| Cont.ZLMg&Sm | 10 | 110,000 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Copper Range.. | 10 | 100,000 | .... | .... | 31.00 | 30.00 | .... | .... | .... | .... | 30.00 | 29.00 | 30.50 | .... | 660 |
| Crescent, s | 10 | 300,000 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| Dominion Coal. | 100 | 150,000 | 45 0 | 43 00 | 45.00 | 43.25 | .... | .... | 43.00 | 41.00 | 45 00 | 40.50 | 44.00 | 42.00 | 11,507 |
| do. pref. | 100 | 20,000 | 118 | .... | .... | .... | .... | .... | 118 | .... | 118¾ | 118 | 118 | .... | 185 |
| Elm River Mg.. | 100 | 100,000 | 5.00 | .... | 5 00 | .... | .... | .... | .... | .... | 5 25 | 4 63 | 4.75 | 4.25 | 1,025 |
| Federal Steel.. | 100 | 464,843 | 51.50 | 52.50 | 4 75 | 53.00 | .... | .... | 49 75 | 49.00 | 47.0. | 43.10 | 47 25 | 43.00 | 12,?79 |
| do. pref | 100 | 532,610 | 77 10 | 73.0. | 6.50 | 75 50 | .... | .... | 74 00 | 71 00 | 73 00 | 70.50 | 2.00 | 7.00 | 2,644 |
| Franklin, c | 25 | 100,000 | 14 5. | 13 50 | 14.00 | 4.00 | 11.75 | .... | 14 50 | 11 00 | 13.00 | 12.25 | 14.50 | 13.00 | 2,9 0 |
| Humboldt | 25 | 40,000 | .... | .... | .... | .... | 2.00 | 1 10 | .... | .... | .... | .... | 1.00 | .... | 50 |
| I. koyal Con. c. | 25 | 100,000 | 25.00 | 20.00 | 25 00 | 24 00 | 23.25 | 22.00 | 24.00 | 22.00 | 3.00 | 22.00 | 24.00 | 23 25 | 4,190 |
| Mass. Con | 10 | 100 000 | 9.0. | .... | 9.50 | 9.00 | .... | .... | .... | .... | .... | .... | 9 00 | .... | 410 |
| Melones | 10 | 167,577 | 1.75 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 260 |
| Merced, g | 25 | 100,000 | .... | .... | .... | .... | .... | .... | .... | .... | 9.00 | .... | 9.25 | 8 00 | 265 |
| Michigan | 25 | 100,0.0 | .... | .... | 7.50 | 7.00 | .... | .... | .... | .... | 9.00 | 7.00 | 7.00 | .... | 460 |
| Mohawk, c | 25 | 100,000 | 15.00 | .... | 16.00 | 15 5. | 16 00 | 14.00 | 15.50 | 15 00 | 15.00 | .... | 16.00 | 15.00 | 1,?02 |
| Montana C &C. | 25 | 200,000 | .... | .... | 8.50 | 8.00 | .... | .... | 8.00 | 7 75 | 8.00 | 7.75 | 8.00 | 7.75 | 1,890 |
| Napa | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 10.50 | .... | 20 |
| New Idria | 5 | 100,000 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 10.00 | .... | 150 |
| N.A.Gold Dre'g | 10 | 100,000 | .... | .... | 8.00 | .... | .... | .... | .... | .... | 4.00 | .... | 3.00 | 2 00 | 1,350 |
| Old Colony, c | 25 | 100,000 | 5.0. | 4 00 | 5.00 | 4.75 | 4 50 | 4.00 | 4 00 | .... | 4 50 | 4 25 | 5.00 | 4.75 | 4,656 |
| Old Dominion,c | 25 | 150,000 | 23.00 | 19 00 | 22 00 | 21.50 | 21.00 | 19 50 | 20 00 | 18.00 | 21 00 | 18 00 | 21.00 | 0 00 | 2,212 |
| Osceola, c | 25 | 93,000 | 66.0. | 61.00 | 69 0. | 65.00 | 65.00 | 64 00 | 65 25 | 64 00 | 67.50 | 64.00 | 70.00 | 68.00 | 5,126 |
| Parrot, s c | 10 | 229,850 | 35.00 | 32.50 | 37.50 | 34.0. | 32.50 | .... | 34 00 | 32.00 | 37 00 | 32.50 | 37.00 | 35.50 | 7,880 |
| Pioneer, q | 10 | 100,000 | 2.18 | .... | 2 25 | .... | 2.50 | 1.75 | 2.00 | .... | .... | .... | .... | .... | 290 |
| Quincy, c | 25 | 100,000 | 135 | 132 | 135 | 134 | 132 | 130 | 135 | 130 | 135 | 132½ | 136 | 135 | 640 |
| Rhode Island | 25 | 100,000 | .... | .... | 5 13 | 5 00 | 5.00 | .... | .... | .... | 5.00 | .... | 5.00 | 4.50 | 400 |
| Santa Fe, g. & c | 10 | 250,000 | 6.00 | 5.00 | 5.75 | 5.00 | 5.00 | 4 50 | 5.00 | 4.50 | 5.00 | 4.50 | 5.25 | 5.00 | 8,299 |
| San. Ysabel, g. | 5 | 130,000 | 7.75 | 7 50 | 7.75 | .... | 7.75 | 7.25 | 7 50 | 7 00 | 7 25 | 6.50 | 7 00 | .... | 1,835 |
| Tamarack, c | 25 | 60,000 | 195 | 180 | 195 | 187.5 | .79 | .... | 183 | 180 | 178 | 175 | 180 | 175 | 1,381 |
| Tecumseh | 25 | 80, 0. | 4 00 | .... | .... | .... | .... | .... | 4 00 | 3.50 | 3.50 | .... | .... | .... | 255 |
| Tri Mountain.. | 25 | 100,000 | 8.00 | 7.60 | 7.50 | .... | .... | .... | 7.00 | .... | 6.50 | 6.00 | 7 00 | 6 50 | 1,315 |
| Union C L | .... | 80,000 | 3.25 | .... | .... | .... | .... | .... | 3.00 | 2.50 | 3.00 | .... | 2.75 | 2.50 | 485 |
| United States | 25 | 250,000 | 30.25 | 30 00 | 25 50 | 24 00 | .... | .... | 24.00 | .... | .... | .... | .... | .... | 7,9?8 |
| U. S. Oil | 25 | 100,000 | 30.50 | 25 00 | 28.50 | 25 50 | .... | .... | 26.0. | 20.00 | 26.00 | 23.00 | 28.00 | 25.50 | 8,306 |
| Utah Cons,g &c | 5 | 3.0,000 | 28 25 | 26.50 | 29.50 | 29.00 | 24 00 | 22.50 | 26.50 | 23.00 | 25.00 | 21.00 | 25.00 | 24.00 | 11,258 |
| Victoria | 25 | 100,0.0 | 4.00 | .... | 4.00 | 3.25 | .... | .... | .... | .... | 3.50 | 3 00 | 3 50 | .... | 905 |
| Washington | 25 | 40,000 | 1.50 | .... | .... | .... | 1.00 | .... | 1 13 | 1.00 | 1.25 | 1.00 | 1.00 | .... | 890 |
| White Knob | .... | .... | .... | .... | .... | .... | 10.00 | 8 00 | .... | .... | .... | .... | .... | .... | .... |
| Winona, c | 100 | 50,000 | 5.25 | .... | 5.0. | 4 50 | 5.00 | 4 00 | 5.00 | 4.25 | .... | .... | 5 50 | .... | 670 |
| Wolverine, c | 25 | 60,000 | 37.0. | 34.50 | 38.00 | 36 00 | 35.00 | 34.50 | 36.00 | 34.75 | 38.00 | 34 50 | 37.88 | 37.00 | 1,819 |
| Wyandotte | 25 | 100,0 0 | .... | .... | .... | .... | .... | .... | 2 00 | .... | 2. 0 | .... | 2 00 | .... | 380 |

Official quotations Boston Stock Exchange. *Ex-dividend. Total sales, 173,025.

## COLORADO SPRINGS, COLO.‡

| NAME OF COMPANY. | Par val | Dec. 11. B. | Dec. 11. A. | Dec. 12. B. | Dec. 12. A. | D c 13. B. | D c 13. A. | Dec. 14. B. | Dec. 14. A. | Dec 18 B. | Dec 18 A. | Dec. 19. B. | Dec. 19. A. | Sale |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alame | $1 | .13¾ | .14 | .14 | .14¾ | .14 | .... | .14¾ | .15 | 15 | 15¾ | .15¾ | .16¾ | 6,500 |
| Anaconda | 1 | .36 | .39¾ | .... | .40 | .... | .... | 41¾ | .43¾ | .41 | .43 | .40¾ | .41 | 9,4?0 |
| Arg'ntumJ | 1 | .19 | .19¾ | .19 | .19¾ | .19 | .20 | .19 | .19¾ | .17 | .19 | .19 | .19¾ | 1,200 |
| Cadillac | 1 | .02¼ | .02¾ | .02¾ | .02¾ | .01¾ | .02¼ | .01¾ | .02¾ | .... | .... | .... | .... | 1,000 |
| C. C. Con | 1 | .15 | .15¾ | .15 | .15¾ | .15¾ | .15¾ | .15¾ | .15¾ | .14¾ | .15 | .15¾ | .18¾ | 11,000 |
| Dante | 1 | .17¾ | .17¾ | .... | 17 | 16¾ | .17 | .16¾ | .17 | .... | .... | .... | .... | 40,500 |
| ElktonCon | 1 | 1.18 | 1 18¾ | 1.16 | .... | 1.16¾ | 1 17¾ | 1 14 | 1.16 | 1.12¾ | 1.13 | 1.15¾ | 1.16¾ | 20,100 |
| El Paso G | 1 | .23 | .... | .24 | .28 | .25¾ | .30 | .23¾ | .30 | .30 | .32 | .29 | .32 | 9 500 |
| Favorite | 1 | .05¾ | .05¾ | .05¾ | .05¾ | .0 ¾ | .5¼ | .05¾ | 03½ | .... | .... | .... | .... | 8,000 |
| Findley | 1 | .12¾ | 13 | .12¾ | .13¾ | .12¾ | .13¾ | .13¾ | .13¾ | .13 | .13¾ | .13¾ | .14 | 8,500 |
| Golden Fl | 1 | .... | .... | .... | .... | .... | .... | .31 | .29 | .31 | 30 | .32 | .... | 500 |
| Gold Hill | 1 | .... | .... | .02¾ | .03¾ | .... | .09 | .02¾ | .02¾ | .... | .... | .... | .... | 5,000 |
| Ing. Con | 1 | .13¾ | .13¾ | .13¾ | .... | .... |

# STOCK QUOTATIONS.

## DENVER, COLO.‡

| NAME OF COMPANY. | Par val. | Dec. 9 B. | Dec. 9 A. | Dec. 11 B. | Dec. 11 A. | Dec. 12. B. | Dec. 12. A. | Dec. 13. B. | Dec. 13. A. | Dec. 14. B. | Dec. 14. A. | Dec. 15 B. | Dec. 15 A. | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mines:** | | | | | | | | | | | | | | |
| Anac'da G.. | $5 | ..... | 41 | ..... | ..... | .39 | ..... | ..... | ..... | .40¼ | ..... | .43 | ..... | 1,100 |
| Arg. J..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bankers..... | 1 | ..... | ..... | .13½ | ..... | .10¼ | .10½ | .10¾ | ..... | .10¾ | .11¾ | .11¾ | ..... | ..... |
| Crippled'C. | 1 | .15 | ..... | .17½ | ..... | ..... | .15 | ..... | .16¾ | ..... | ..... | ..... | ..... | ..... |
| Della S..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Elkton Con | 1 | 1.18 | ..... | ..... | 1 19 | ..... | 1.19 | ..... | ..... | 1.16 | 1.19 | ..... | ..... | ..... |
| Findley..... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .12¾ | ..... | ..... | ..... | ..... |
| Garf. Con.. | 1 | ..... | ..... | ..... | ..... | ..... | .19 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gold Coin.. | 1 | ..... | ..... | 2.25 | 2.40 | 2.20 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Goldstone.. | 1 | ..... | ..... | .02½ | ..... | .02¼ | .02¾ | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Indepn'd'nc | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Ironclad.. | 1 | ..... | .03½ | .04½ | ..... | ..... | ..... | ..... | .04½ | ..... | ..... | .04¾ | .05¼ | 2,000 |
| Isabella.... | 1 | 1.37½ | ..... | ..... | 1 38 | 1.32½ | ..... | ..... | ..... | 1.39¾ | ..... | 1.39 | 1.40 | 800 |
| Jack Pot... | 1 | 61 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .60 | ..... | ..... |
| Jefferson.. | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .08¾ | ..... | ..... |
| Keystone .. | 1 | .13 | 15 | ..... | ..... | ..... | .14½ | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| LosAngeles | 1 | ..... | .09½ | .09¾ | ..... | ..... | ..... | .07¾ | .08¼ | ..... | .07¾ | .07¼ | .07¾ | ..... |
| Mollie Gib. | 5 | ..... | ..... | ..... | .26 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| NewZealnd | 1 | ..... | ..... | ..... | ..... | ..... | ..... | .43¼ | ..... | ..... | .44 | .40 | ..... | 2,000 |
| Ophir ..... | 1 | ..... | ..... | ..... | ..... | .80 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Pharmacist | 5 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Portland.. | 1 | ..... | 2 64 | ..... | ..... | ..... | 2.37 | ..... | 2.30 | ..... | ..... | ..... | ..... | 400 |
| Specimen.. | 1 | ..... | ..... | .10¾ | ..... | .10 | .10¾ | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Union Gold | 1 | .35 | ..... | .34¾ | ..... | .35 | ..... | ..... | .37 | .35¾ | ..... | .35¾ | ..... | 1,000 |
| Vindicator. | 1 | 1.74 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Work..... | 1 | .29 | ..... | ..... | ..... | .28 | .30 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| **Prosp'cts:** | | | | | | | | | | | | | | |
| C.C Imp ... | 1 | ..... | ..... | ..... | .005½ | .004 | .005 | .004½ | .005 | .004¼ | 0.5 | .004¾ | 005 | 18,000 |
| Illinois .... | 1 | ..... | .01¾ | .009¼ | ..... | .009½ | .01 | .009¾ | .01 | .009¾ | 01 | .01 | .01¾ | 35,000 |
| Old Gold.... | 1 | ..... | ..... | .01¾ | .018¾ | .01¾ | ..... | 01¾ | ..... | ..... | ..... | .01¾ | ..... | 1,000 |
| Puritan .... | 1 | ..... | .02¾ | ..... | .02¾ | 20½ | .02¾ | .02 | .02¾ | .02¼ | .02¾ | .02¾ | .02¾ | ..... |
| **Miscell.:** | | | | | | | | | | | | | | |
| Acacia..... | 1 | ..... | ..... | ..... | ..... | .85¼ | ..... | ..... | ..... | .86¼ | .87½ | ..... | ..... | ..... |
| Alamo..... | 1 | .13¾ | .13¾ | .13 | 13¾ | .13 | .14¼ | .14¾ | ..... | .14¾ | .15 | .15 | ..... | 7,000 |
| Aola..... | 1 | .05¼ | .05¾ | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .03¾ | ..... | ..... | ..... |
| Battle Mt.. | 1 | .31 | ..... | ..... | ..... | .31¾ | ..... | ..... | ..... | ..... | .33 | .37 | ..... | ..... |
| Bob Lee .. | 1 | ..... | .08 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| C. C. & M.. | 1 | .17 | .17½ | .16¼ | ..... | 16 | 16¼ | 15¾ | ..... | ..... | .16¾ | ..... | ..... | 17,000 |
| De Beers.... | 1 | .009 | ..... | .009½ | ..... | 009 | .01¼ | 009 | .01½ | 009 | .009¾ | ..... | ..... | ..... |
| Des Moines | 1 | ..... | ..... | ..... | .06¾ | ..... | .06 | ..... | .06 | ..... | .05¾ | .06 | ..... | ..... |
| Favorite.... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | .15¾ | ..... | ..... |
| G'd'nEagle | 1 | .57 | .62 | ..... | .54 | ..... | .56 | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gr'nite Hill | 1 | ..... | ..... | ..... | ..... | .05 | ..... | .05 | ..... | ..... | ..... | ..... | ..... | ..... |
| Magnet R... | 1 | ..... | .05 | ..... | .04¾ | ..... | ..... | ..... | ..... | .03¼ | ..... | ..... | ..... | ..... |
| Moblie..... | 1 | ..... | ..... | .03¾ | ..... | .03¾ | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mt. Beauty. | 1 | ..... | .10¾ | ..... | ..... | .10¾ | .10¾ | .10¼ | ..... | .10¾ | .11 | ..... | .11 | 1,000 |
| Trachyte... | 1 | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

‡ Official Quotations Denver Stock Exchange. Total sales, 80,800 shares.

## SAN FRANCISCO, CAL.

| NAME OF COMPANY. | Location. | Par. value. | Dec. 14. | Dec. 15. | Dec. 16. | Dec. 18. | Dec. 19. | Dec. 20. |
|---|---|---|---|---|---|---|---|---|
| Alpha Con..... | Nev. | 1.00 | .03 | .03 | .03 | .03 | .04 | .03 |
| Alta..... | " | 2.00 | .14 | .06 | .07 | .05 | .04 | .06 |
| Andes..... | " | 3.00 | .10 | .11 | .12 | .11 | .11 | .11 |
| Belcher..... | " | 3.00 | .18 | .17 | .15 | .14 | .12 | .13 |
| Best & Belcher... | " | 3.00 | .33 | .35 | .34 | .32 | .28 | .27 |
| Bullion..... | " | 1.00 | .03 | .03 | .03 | .03 | .03 | .03 |
| Caledonia ..... | " | 3.00 | .51 | .50 | .52 | .50 | .50 | .48 |
| Challenge Con..... | " | 3.00 | .14 | .14 | .13 | .10 | .11 | .10 |
| Chollar..... | " | 3.00 | .15 | .15 | .15 | .14 | .15 | .13 |
| Confidence..... | " | 3.00 | .65 | .65 | .65 | .64 | .65 | .65 |
| Con. California & Virginia.... | " | 2.50 | 1.70 | 1.70 | 1.65 | 1 55 | 1 55 | 1 50 |
| Cons. Imperial.... | " | 1.00 | .01 | .01 | .01 | .01 | .01 | .01 |
| Crown Point ..... | " | 3.00 | .16 | .16 | .16 | .15 | .13 | .13 |
| Gould & Curry..... | " | 3.00 | .11 | .11 | .10 | .10 | .11 | .09 |
| Hale & Norcross .. ..... | " | 3.00 | .36 | .37 | .36 | .35 | .31 | .32 |
| Julia Con..... | " | 1.00 | .02 | .02 | .03 | .02 | .04 | .04 |
| Justice..... | " | 2.00 | .05 | .05 | .06 | .04 | .03 | .01 |
| Kentuck Con..... | " | 1.00 | .01 | .01 | .01 | .01 | .01 | .02 |
| Mexican..... | " | 3.00 | .40 | .41 | .36 | .32 | .32 | .30 |
| Occidental Con..... ..... | " | 3.00 | .12 | .12 | .12 | .13 | .12 | .11 |
| Ophir..... | " | 3.00 | .88 | .89 | .83 | .76 | .77 | .71 |
| Overman ..... | " | 3.00 | .11 | .11 | .11 | .10 | .10 | .10 |
| Potosi..... | " | 3.00 | .16 | .17 | .16 | .16 | .17 | .16 |
| Savage..... | " | 3.00 | .09 | .09 | .10 | .08 | .08 | .08 |
| Seg. Belcher & M.. | " | 2.00 | .03 | .02 | .02 | .02 | .03 | .02 |
| Sierra Nevada..... | " | 3.00 | .50 | .49 | 47 | .44 | .44 | .43 |
| Standard..... | Cal. | 10.00 | 2.75 | 2.75 | 2.75 | 2.20 | 2 25 | 2 50 |
| Union Con.... | Nev. | 2.50 | .30 | .30 | .28 | .25 | .25 | .26 |
| Utah Con..... | " | 1.00 | .05 | .05 | .06 | .04 | .04 | .04 |
| Yellow Jacket..... | " | 3.00 | .12 | .11 | .11 | .10 | 10 | .09 |

Official telegraphic quotations of San Francisco Stock Exchange.

## TORONTO, ONT.*

| NAME OF COMPANY. | Par val. | Dec. 12 B. | Dec. 12 A. | Dec. 13. B. | Dec. 13. A. | Dec 14. B. | Dec 14. A. | Dec. 15 B. | Dec. 15 A. | Dec. 16. B. | Dec. 16. A. | Dec. 18. B. | Dec. 18. A | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ontario: | | | | | | | | | | | | | | |
| Alice A. .. | $1 | .08¾ | .12 | .08 | .10 | .08 | .12 | ..... | ..... | .08 | .12 | .08 | .12 | 3,500 |
| Empress .. | 1 | .02¼ | .03¾ | .02½ | .03¼ | .02 | 03¾ | .02 | .03¾ | .02 | .02½ | .03 | .03 | 1,000 |
| Golden Star | 1 | .31¾ | .34 | .3 ¾ | .33 | .31¼ | .31 | .33 | ..... | .30¾ | .33¾ | .30¼ | .33 | 500 |
| Ham Reef.. | 1 | .12 | .19 | .14 | .19 | .15 | .19 | .14 | .20 | .14 | .19 | .18 | .18 | ..... |
| British Col.: | | | | | | | | | | | | | | |
| Athabaska.. | 1 | .32 | .37 | .3.¼ | .36 | .32 | 36 | .30 | .36 | 32 | .36 | .32 | .34 | 2,500 |
| Br'd'n&G.C. | 1 | .26 | .30 | .26 | .30 | .27 | .30 | .25 | .30 | .27 | .27 | .30 | ..... | ..... |
| Crow's N. C. | .25 | 33.00 | 39.00 | 32 50 | 38 50 | 34 25 | 38.00 | 33.50 | 38.00 | 33.00 | 38.50 | 32.50 | 36.50 | ..... |
| Dardanelles | 1 | .10 | .2 | 10 | .11¾ | .10¾ | .11¾ | .11 | .11¾ | .10¾ | 12 | .10 | .12 | ..... |
| DeerT'lNo 2 | 1 | .12 | .14¼ | .10¾ | .12¾ | 10¼ | .13¾ | .11 | .11¾ | .10¼ | .11¾ | .10 | .12 | 8,500 |
| Even'g Star | 1 | .08¼ | .09¼ | 07 | .08¼ | .08¾ | 08¾ | .08¼ | .09¾ | 07 | .08¾ | .08 | .08¼ | 4,000 |
| Fairview C | .25 | .04 | .05¼ | .04 | .0 ¼ | .0.¾ | 04½ | 03 | .05 | .04 | .05¼ | .04 | .05 | 500 |
| Insurgent .. | 0.10 | 02 | 04 | 03 | .04 | ..... | ..... | ..... | ..... | 02 | .04 | .02 | .04 | ..... |
| Iron Mask.. | 1 | .67 | .72 | 65 | .75 | .60 | .65 | 60 | .64 | .60 | .69 | 67 | .72 | 400 |
| Jim Blaine | 1 | .24 | .27 | .23 | .27 | ..... | ..... | ..... | ..... | .23¼ | .27 | 23 | .27 | 500 |
| Minnehaha | 1 | .14 | .16¾ | .13¾ | 16 | .13¾ | .15 | .13 | .15 | .12¾ | .14¾ | .12 | .14 | 500 |
| Mont.Cristo | 1 | .06 | .08 | 05 | .08 | .06 | .07 | .06 | .07 | 05¾ | .08 | .06 | 07 | 1,500 |
| Mont &Lon. | 0.24 | .37½ | .42 | .38 | .40 | .38 | .39½ | ..... | ..... | .38 | .40 | .36 | .40 | 500 |
| Morrison.... | 1 | .07½ | .10¾ | .07 | 10 | .10¼ | ..... | 10 | ..... | .07 | .12 | .05 | 09 | ..... |
| Noble Five. | 1 | .11 | .18 | .13¾ | 18 | .10 | .18 | .14 | .18 | .14 | .18 | .10 | 12 | ..... |
| No Belle.... | 1 | .01¾ | .03 | .01¾ | 02 | .01¼ | .01¾ | 01¾ | .01¾ | .01¾ | .02¼ | .0¾ | 02 | 9,500 |
| Nambler.... | 1 | .57 | .59¼ | .56½ | .59 | 57 | .59 | .55 | .58 | .56 | .59 | .55½ | .59 | ..... |
| Republic... | 1 | 1.08 | 1.12¾ | 1 04 | 1.12 | 1 05 | 1.10 | 1.10 | 1.10 | 1.05 | 1.06 | 1 05 | 1.05 | 100 |
| Van Anda . | 1 | .04 | .05¾ | .04¾ | .05¼ | .05 | .05¼ | .05 | .05¾ | .04¾ | .06 | ..... | ..... | 22,500 |
| Victory Tri. | 1 | .03 | .05 | .03 | .05 | .03 | .05¼ | .03 | .05 | .03 | 05¼ | .03¼ | .04 | 1,000 |
| Virtue .... | 1 | .63¾ | .70 | .60¾ | .63 | ..... | ..... | ..... | ..... | 60 | .65 | 56¼ | .58 | ..... |
| War Eagle.. | 1 | 2.69 | 2.79 | 2.57 | 2.75 | 2 68 | 2.78 | 2.53 | 2 68 | 2.58 | 2.66 | 2.40 | 2.55 | ..... |
| Waterloo.... | 0.10 | .12 | .13¾ | .11¾ | .13¾ | 12 | 13¾ | .11 | 13 | .11 | 13¼ | .12 | .13¼ | 3,500 |
| White Bear. | 1 | .03 | .04 | 03 | 04 | .03¼ | .03¾ | .03 | .04 | .03 | .04 | 03¼ | .04 | 9,000 |
| Winnipeg.. | 1 | .32½ | .32 | .28 | .3.¼ | .28½ | .30 | .27 | .31 | .29 | .32 | .29 | .31 | 4,000 |
| Develop Co. | | | | | | | | | | | | | | |
| B.C.G.F'lds | 1 | .03 | .04 | .03 | .01 | .03¼ | .03¾ | .03 | 04 | .03 | .04 | .03 | 04 | 1,500 |
| Can. G. F. S. | 0 10 | .06¾ | .08 | .06¾ | .08 | .16¾ | .07¾ | .06¾ | .08 | .06¾ | .8 | .06 | .08 | 4,000 |
| Gold Hills . | 1 | .04¾ | .05¾ | .04 | .05¾ | .04¾ | .05¾ | .04¾ | .05 | .04 | .05¾ | .04 | .06 | 2,000 |

* Official quotations of the Standard and Toronto Mining and Industrial Exchanges. Total shares sold, 76,000.

## MEXICO.

Dec. 8.

| NAME OF COMPANY. | No. of shares. | Last div'd. | Prices. Op'g. | Prices. Cl'g. | NAME OF COMPANY. | No. of shares. | Last div'd | Prices. Op'g. | Prices. Cl'g. |
|---|---|---|---|---|---|---|---|---|---|
| Chihuahua: | | | | | Hidalgo: | | | | |
| Gloria..... | 1,500 | ..... | $50 | $50 | Real del Monte.. | 2,554 | 10.00 | 540 | 550 |
| Durango: | | | | | San Francisco He | 6,000 | 3.00 | 220 | 225 |
| Barradon y Cab.... | 2,400 | ..... | 40 | 40 | San Rafael y An. | 1,200 | 12.00 | 1,600 | 1,020 |
| Candelaria de Pan. | 1,200 | ..... | 20 | 20 | do. aviado ... ... | 1,200 | 6.00 | 400 | 410 |
| Capuzaya..... | 2,400 | ..... | 30 | 30 | do. del Oro..... | 3,000 | 5 00 | 20 | 20 |
| Penoles..... | 2,500 | 30.00 | 2,000 | 2,000 | Soledad..... | 960 | 5.00 | 300 | 330 |
| Restauradora..... | 10,000 | ..... | 20 | 20, | Sorpresa..... | 960 | 7.50 | 260 | 300 |
| Rosario y Anexas.. | 4,800 | ..... | 10 | 10 | Union Hacienda. | 2,000 | 5.00 | 350 | 340 |
| Guanajuato: | | | | | Mexico: | | | | |
| Angustias..... | 2,400 | 5.00 | 225 | 230 | Coronas..... | 500 | ..... | 75 | 75 |
| Cinco Senores y An | 2,000 | 15.00 | 170 | 200 | Esperanza y An.. | 3,000 | 10.00 | 1,580 | 1,560 |
| El Oro..... | 500 | ..... | 00 | 30 | Michoacan | | | | |
| do. pref. | 2,000 | ..... | 30 | 30 | Luz de Borda ava | 4,000 | ..... | 30 | 22 |
| Guadalupe Hacie'a | 10,000 | 2.00 | 240 | 285 | Pueblo: | | | | |
| Trinidad, aviador . | 2,000 | ..... | 35 | 25 | Tlaxingo..... .... | 2,400 | ..... | 27 | 28 |
| do. aviada..... | 400 | ..... | 25 | 20 | S. Luis Potosi: | | | | |
| Zona Minera de Paz | 2,400 | ..... | 25 | 28 | Concep. y An..... | 2,400 | ..... | 230 | 240 |
| Hidalgo: | | | | | Sta.MariadelaPaz | 2,400 | 10 00 | 730 | 840 |
| Amistad y Concord. | 9,600 | 1.47 | 28 | 29 | Zacatecas: | | | | |
| Arevalo..... | 720 | ..... | 200 | 200 | Asturiana y An.. | 2,500 | 10.00 | 270 | 260 |
| Bartolome de Med. | 2,000 | 2.00 | 65 | 70 | Cabezon ..... | 2,400 | ..... | 15 | 15 |
| Carmen..... | 1,100 | 7.75 | 350 | 900 | C'delar. de Pinos. | 2,500 | ..... | 85 | 100 |
| Luz de Maravillas.. | 800 | ..... | 130 | 100 | Palma de Somb.. | 2,400 | ..... | 100 | 80 |
| Pabellon..... | 800 | 27.50 | 30 | 20 | | | | | |

## PARIS.

Nov. 30.

| NAME OF COMPANY. | Country. | Product. | Capital Stock. | Par value. | Latest divs. | Prices. Op'ning | Prices. Closing |
|---|---|---|---|---|---|---|---|
| | | | Francs. | Fr. | Fr. | Fr. | Fr. |
| Aciaries de Creusot..... | France..... | Steel mfrs.. | 27,000,000 | 2,000 | 75.00 | 1,975.00 | 1,981.00 |
| " " Firminy..... | " | " " .. | 3,000,000 | 500 | 125.00 | 3,600.00 | 3,630 00 |
| " " Fives-Lille.. | " | " " .. | 12,000,000 | 500 | 35.00 | 540 0 | 543.00 |
| " " Huta-Bank.. | Russia..... | Iron & steel | ..... | 500 | ..... | 4,775.0 | 4,660.00 |
| " " la Marine.. | France..... | Steel mfrs.. | 20.000,000 | 500 | 70.00 | 1,770.00 | 1,769 00 |
| Anzin..... | " | Coal..... | ..... | 220.00 | 7,859.00 | 7,900.00 | |
| Boleo..... | Lower Cal. | Copper..... | ..... | 500 | 1.07 | 2,869.0. | 2,860.00 |
| Briansk..... | Russia | Coal & Iron | ..... | 500 | ..... | 1,270.75 | 1,288 75 |
| Caamp d'Or..... | S. Africa.. | Gold..... | 3,375,000 | 25 | 3.75 | 4.75 | 38.75 |
| Courrieres..... | France..... | Coal..... | 600,000 | 300 | 70.00 | 3,000.00 | 3,0 0.00 |
| Dombrowa..... | Russia ..... | Coal..... | ..... | 500 | 12.50 | 1,1 0.00 | 1,1.0 00 |
| Donetz..... | " | Steel..... | ..... | ..... | ..... | 1,20 1.00 | 1,202.50 |
| Dynamite Centrale.... | France..... | Explosives.. | ..... | 500 | 12.40 | 475.00 | 477.00 |
| Escombrera-Bleyberg.. | Spain..... | Lead..... | ..... | 500 | 35.00 | 1,.85.00 | 1,335 00 |
| Fraser River..... | Brit. Col'mb | Gold..... | 250,000 | 25 | ..... | 7.00 | 7.00 |
| Huanchaca ..... | Bolivia..... | Silver..... | 40,000,000 | 125 | 5.00 | 54.00 | 54.00 |
| Laurium..... | Greece..... | Zinc & lead. | 16,300,000 | 500 | 30.00 | 630 00 | 635.00 |
| Malfidano..... | Italy..... | Zinc..... | 12,500,000 | 500 | 50.00 | 1,335.0. | 1,325.00 |
| Metaux, Cie. Fran. de.. | France..... | Metal d'ders. | 25,000,000 | 500 | 30.00 | 525.00 | 520.00 |
| Mokta-el-Hadid..... | Algeria..... | Iron..... | 18,312,500 | 500 | 40.00 | 1,2 .00 | 1,220.00 |
| Napthe Baku..... | Russia ..... | Petroleum.. | ..... | ..... | ..... | 8 6.00 | 823.00 |
| Napthe, Le..... | " ..... | " .. | ..... | ..... | ..... | 1,3 0.00 | 1,300.00 |
| Napthe Nobel..... | " ..... | " .. | ..... | ..... | ..... | 681.50 | 706.50 |
| " parts..... | " ..... | " .. | ..... | ..... | ..... | 13,662.50 | 14,150.00 |
| Nickel..... | N. Caled'nia | Nickel..... | 10.000.000 | 250 | 10.00 | 367.00 | 367.00 |
| Penarroya..... | Spain..... | Coal, etc.... | ..... | 500 | 65.00 | 2,830.00 | 3,140.00 |
| Rebecca..... | Colo'do, U.S. | Gold..... | 5,000,000 | 25 | ..... | 4.50 | 5.00 |
| Salines de l'Est..... | France..... | Salt..... | ..... | 500 | 11.50 | 300.00 | 235 00 |
| Salines du Midi..... | France..... | " etc..... | ..... | 500 | 25.00 | 960.00 | 1,015 00 |
| Vielle Montagne..... | Belgium ... | Zinc ..... | 9.000.000 | 80 | 30.00 | 78 .00 | 771.00 |

## LONDON.

Dec. 8.

| NAME OF COMPANY. | Country. | Authorized capital. | Par value. | Last dividend. Amt. | Last dividend. Date. | Quotations. Buyers | Quotations. Sellers |
|---|---|---|---|---|---|---|---|
| | | | £ s. d. | s.d. | | £ s. d. | £ s. d. |
| Alaska Goldfields..... | Alaska..... | £300,000 | 1 0 0 | 2 1 | Mar., 1899 | 17 6 | 1 0 0 |
| Alaska-Mexican, g ..... | " ..... | 200,000 | 1 0 0 | 0 4.8 | Nov., 1899 | 17 6 | 1 2 6 |
| Alaska-Treadwell, g..... | " ..... | 1,000,000 | 5 0 0 | 1 6 | Nov., " | 5 0 0 | 5 5 0 |
| Anaconda, c., s..... | Montana..... | 6,000,000 | 5 0 0 | 8 2 | Nov., 1899 | 8 17 6 | 9 2 6 |
| Chiapas, g., s., c..... | Mexico..... | 252,500 | 1 0 0 | ..... | ..... | 5 0 0 | 7 0 |
| Con. Gold Fields ..... .. | " ..... | 300,000 | 1 0 0 | ..... | ..... | 15 0 0 | 1 0 0 |
| De Lamar, g., s..... | Idaho..... | 400,000 | 1 0 0 | ..... | May, 1899 | 2 6 | 5 0 |
| Elkhorn Priority (New), s | Colorado..... | 87,500 | 1 0 0 | 2 0 | June, 1898 | 1 3 | 3 9 |
| Golden Gate, g..... | California..... | 80,000 | 1 0 0 | ..... | ..... | 1 0 | 2 0 |
| Grand Central, g., s..... | Mexico..... | 300,000 | 1 0 0 | 2 0 | Aug., 1899 | 1 6 3 | 1 8 9 |
| Hall Mines, c., s..... | British Col.... | 250,000 | 1 0 0 | 1 0 | May, 1899 | 4 1 | 4 0 |
| Le Roi, g..... | " .. .. | 1,000,000 | 5 0 0 | 5 0 | Nov., 1899 | 5 16 3 | 5 18 9 |
| *Lillie, g..... ..... | Colorado..... | 250,000 | 1 0 0 | 2½ | Dec., 1899 | 15 0 | 1 1 0 |
| Montana, g., s..... | Montana..... | 960,000 | 1 0 0 | 6 | Apr., 1899 | 4 0 | 5 0 |
| Mountain Copper..... | California..... | 1,250,000 | 5 0 0 | 9 0 | Sept., 1899 | 7 0 0 | 7 5 0 |
| Newfoundland, c..... | Newfoundland. | 250,000 | 1 0 0 | ..... | ..... | 7 6 | 12 6 |
| Palmarejo & Mexican, g., s | Mexico..... | 800,000 | 1 0 0 | ..... | ..... | 3 0 | 4 0 |
| Stratton's Independence.. | Colorado..... | 1,100,000 | 1 0 0 | 2 0 | Dec., 1899 | 2 17 6 | 3 0 0 |
| Copiapo, c ..... | Chile..... | 200,000 | 2 0 0 | 8 0 | Dec., 1899 | 4 17 6 | 4 2 6 |
| Frontino & Bolivia, g .... | Colombia..... | 140,000 | 1 0 0 | 1 6 | Oct., 1899 | 1 17 6 | 2 2 0 |
| St. John del Rey, g..... | Brazil..... | 600,000 | 1 0 0 | 1 3 | June, 1899 | 1 8 6 | 1 9 6 |
| UtahCon..g(High'ndBoy) | Utah..... | 800,000 | 1 0 0 | rts. | Mar., 1898 | 6 17 6 | 6 7 2 6 |
| Velvet, g..... | BritishCol'mbia | 100,000 | 1 0 0 | ..... | ..... | 1 8 9 | 1 11 3 |
| Ymir, g..... | " | 200,000 | 1 0 0 | 1 0 | Nov., 1899 | 1 7 6 | 1 10 0 |
| British Am. Corp..... | " | 1,500,000 | 1 0 0 | rts. | Dec., 1898 | 1 0 3 | 1 0 9 |
| Linares, l ..... | Spain ..... | 45,000 | 3 0 0 | 12 6 | Oct., 1899 | 3 10 0 | 3 15 0 |
| Mason & Barry, c., sul.... | Portugal..... | 450,000 | 2 0 0 | 5 0 | May, 1899 | 4 2 6 | 4 7 6 |
| Rio Tinto, c ..... | Spain..... | 1,625,000 | 5 0 0 | 1 15 | Nov., 1899 | 46 5 0 | 46 10 0 |
| " " pref..... | " ..... | 1,625,000 | 5 0 0 | 2 5 | " 1899 | 6 2 0 | 6 2 6 |
| Tharsis, c..... | " ..... | 1,250,000 | 2 0 0 | 11 0 | May, 1898 | 9 0 0 | 9 5 0 |
| Assoc. Gold Mines..... | W. Australia.. | 500,000 | 1 0 0 | 4 0 | Oct., 1899 | 9 2 6 | 9 5 0 |
| Broken Hill Prop., s..... | N.S. Wales..... | 384,000 | 8 | 1 0 | Oct., 1899 | 2 2 6 | 2 5 0 |
| Great Boulder Prop. .... | W. Australia.. | 1,750,000 | 2 0 0 | 6 | Dec., 1899 | 1 17 0 | 1 18 0 |
| Hannan's Brownhill, g.... | " ..... | 110,000 | 1 0 0 | 5 6 | Jan., 1900 | 12 15 0 | 12 0 0 |
| Ivanhoe Gold Corp.... | " ..... | 1,000,000 | 5 0 0 | 5 0 | Oct., 1899 | 16 0 0 | 16 10 0 |
| Kalgurlie, g ..... | " ..... | 120,000 | 1 0 0 | rts. | Feb., 1899 | 9 2 6 | 9 7 6 |
| Lake View Consols, g. .... | " ..... | 250,000 | 1 0 0 | £1 | Nov., 1899 | 8 3 6 | 8 7 6 |
| Mt. Lyell M. & R., l., c .... | Tasmania..... | 975,000 | 3 0 0 | 4 0 | Oct., 1899 | 10 2 6 | 10 7 6 |
| Mt. Morgan, g..... | Queensland..... | 1,000,000 | 1 0 0 | 7 | Dec., 1899 | 5 0 0 | 5 2 6 |
| Waihi, g..... | New Zealand.... | 320,000 | 1 0 0 | 2 0 | Dec., 1899 | 10 0 0 | 10 2 6 |
| Champion Reef, g..... | Colar Fields... | 220,000 | 10 | 5 0 | Jan., 1900 | 5 7 6 | 5 10 0 |
| Mysore Gold, g..... | " ..... | 250,000 | 10 | 4 6 | Nov., 1899 | 5 13 9 | 5 16 3 |
| Nundydroog, g..... | " ..... | 242,000 | 1 0 0 | 3 0 | " 1899 | 3 5 0 | 3 7 6 |
| Ooregam, g..... | " ..... | 145,000 | 1 0 0 | 1 6 | Dec., 1899 | 3 10 0 | 3 12 6 |
| " pref. g..... | " ..... | 130,000 | 1 0 0 | 1 6 | " 1899 | 4 1 3 | 4 3 9 |
| British S. Af., chartered. | So. Africa..... | 5,000,000 | 1 0 0 | rts. | May, 1899 | 3 16 3 | 3 18 9 |
| Cape Copper, c ..... | " ..... | 600,000 | 1 0 0 | 6 6 | Jan., 1900 | 6 2 6 | 6 7 6 |
| " pref ..... | " ..... | 150,000 | 2 0 0 | 6 6 | " 1900 | 5 15 0 | 6 0 0 |
| City & Suburban (New), g | Transvaal..... | 1,360,000 | 4 0 0 | 8 0 | Aug., 1899 | 5 2 6 | 5 7 6 |
| Con. Deep Level, g..... | " ..... | 200,000 | 1 0 0 | x all. | June, 1899 | 1 5 0 | 1 10 0 |
| Crown Reef, g..... ..... | " ..... | 130,000 | 1 0 0 | 18 0 | Nov., 1899 | 11 0 0 | 12 0 0 |
| De Beers Con., d ..... | Cape Colony.... | 3,950,000 | 5 0 0 | £1 | June, 1899 | 28 7 6 | 28 12 6 |
| Ferreira, g ..... | Transvaal..... | 90,000 | 1 0 0 | 30 0 | Aug., 1899 | 20 10 0 | 21 0 0 |
| Geldenhuis Deep, g..... | " ..... | 350,000 | 1 0 0 | 8 0 | Aug., 1899 | 9 0 0 | 9 10 0 |
| Geldenhuis Est., g..... | " ..... | 200,000 | 1 0 0 | 10 0 | Aug., 1899 | 6 0 0 | 6 5 0 |
| Henry Nourse, g..... | " ..... | 125,000 | 1 0 0 | 10 0 | Aug., 1899 | 8 2 6 | 8 12 6 |
| Jagersfontein, d..... | Orange Fr. St.. | 1,000,000 | 5 0 0 | 9 0 | June, 1899 | 14 0 0 | 11 10 0 |
| *Johannesburg Con. Invst | So. Africa..... | 2,750,000 | 1 0 0 | 2 0 | Nov., 1899 | 1 13 9 | 1 16 3 |
| Jubilee, g..... | Transvaal..... | 50,000 | 1 0 0 | 5 0 | Aug., 1899 | 5 15 0 | 6 5 0 |
| Langlaagte Estate, g..... | " ..... | 300,000 | 1 0 0 | 3 0 | Sept., 1899 | 3 5 0 | 3 7 6 |
| May Con., g ..... | " ..... | 275,000 | 1 0 0 | 6 0 | Aug., 1899 | 4 8 9 | 4 11 3 |
| Meyer & Charlton, g..... | " ..... | 85,000 | 1 0 0 | 8 0 | July, 1899 | 5 2 6 | 5 7 6 |
| Namaqua, c..... | Cape Colony.... | 200,000 | 2 0 0 | 6 6 | June, 1899 | 4 15 0 | 4 17 0 |
| Primrose (New), g..... | Transvaal..... | 300,000 | 1 0 0 | 6 0 | Aug., 1899 | 8 17 6 | 4 2 0 |
| Rand Mines, g..... | So. Africa..... | 490,000 | 1 0 0 | 5 0 | Aug., 1899 | 4 12 6 | 4 17 6 |
| Robinson, g ..... | Transvaal..... | 2,750,000 | 5 0 0 | 8 0 | Aug., 1899 | 8 15 0 | 9 0 0 |
| Sheba, g..... | " ..... | 1,100,000 | 1 0 0 | 0 6 | July, 1899 | 1 1 3 | 1 3 9 |
| Sim. & Jack Prop., g..... | " ..... | 5,000,000 | 5 0 0 | 4 0 | July, 1899 | 6 0 0 | 6 2 6 |
| Wolhuter, g..... | " ..... | 860,000 | 4 0 0 | 2 0 | Feb., 1899 | 4 2 6 | 4 7 6 |

* Ex-dividend.

## DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par Val | Dividends. Paid, 1899. | Dividends. Total to Date. | Dividends. Date and Amount of Last. |
|---|---|---|---|---|---|---|---|---|
| 1 | Ætna Cons., q | Cal | $500,000 | 100,000 | $5 | $45,000 | $195,000 | Oct., 1899, .10 |
| 2 | Alaska-Mexican, g | Alask | 1,000,000 | 200,000 | 5 | 72,000 | 429,031 | Oct., 1899, .10 |
| 3 | Alaska-Treadwell, g | Alask | 5,000,000 | 200,000 | 25 | 300,000 | 4,220,000 | Oct., 1899, .37½ |
| 4 | Alice, g. s | Mont. | 10,000,000 | 400,000 | 25 | ..... | 1,075,000 | April, 1898, .05 |
| 5 | Amalgamated, c | Mont. | 75,000,000 | 750,000 | 100 | 1,500,000 | 1,500,000 | Oct., 1899, 2.00 |
| 6 | American Gold, g. s. c. l | Colo. | 3,000,000 | 300,000 | 10 | 48,000 | 434,000 | June, 1899, .09 |
| 7 | Amer. Sm. & Ref., pref | U. S. | 32,500,000 | 32,500 | 100 | 568,750 | 568,750 | Oct., 1899, 1.75 |
| 8 | Am. Zinc, Lead & Sm | Mo | 500,000 | 200,000 | 25 | 40,000 | 40,000 | Oct., 1899, .10 |
| 9 | Anaconda Copper | Mont. | 30,000,000 | 1,200,000 | 25 | 3,900,000 | 12,150,000 | Nov., 1899, 2.00 |
| 10 | Anchoria-Leland, g | Colo. | 600,000 | 600,000 | 1 | 72,000 | 234,000 | Oct., 1899, .03 |
| 11 | Anglo-Mexican, g | Mex. | 2,001,625 | 400,230 | 5 | ..... | 1,728,993 | Dec., 1898, .24 |
| 12 | Apollo Con., g | Cal | 1,000,000 | 100,000 | 10 | 40,000 | 140,000 | Jan., 1899, .40 |
| 13 | Appie Ellen, g | Colo. | 600,000 | 600,000 | 1 | ..... | 25,000 | Aug., 1898, .01 |
| 14 | April Fool | Nev. | 500,000 | 500,000 | 1 | 16,000 | 16,000 | Oct., 1899, .01 |
| 15 | Argonaut | Cal. | 2,000,000 | 200,000 | 10 | 220,000 | 400,000 | Nov., 1899, .10 |
| 16 | Associated, g | Colo. | 1,250,000 | 1,250,000 | 1 | 12,500 | 84,000 | Feb., 1899, .01 |
| 17 | Atlantic, c | Mich. | 1,000,000 | 40,000 | 25 | ..... | 780,000 | Feb., 1898, 1.00 |
| 18 | Aurora, i | Mich. | 2,500,000 | 100,000 | 25 | 50,000 | 890,000 | June, 1899, .50 |
| 19 | Bald Butte | Mont. | 250,000 | 250,000 | 1 | 142,500 | 762,141 | Dec., 1899, .06 |
| 20 | Big Six, g. s | Colo. | 500,000 | 500,000 | 1 | ..... | 15,000 | May., 1898, .00½ |
| 21 | Bonanza | Wash | 1,000,000 | 1,000,000 | 1 | 7,500 | 7,500 | Nov., 1899, .00¼ |
| 22 | Bonanza Dev | N. M. | 3,000,000 | 300,000 | 10 | 1,050,000 | 1,050,000 | June, 1899, 3.50 |
| 23 | Boston-Aurora, pref | Mo | 800,000 | 32,000 | 25 | 26,640 | 26,640 | Nov., 1899, .17 |
| 24 | Boston & California | Cal | 600,000 | 600,000 | 1 | 72,000 | 72,000 | June, 1899, .06 |
| 25 | Boston & Colo. Smelting | Colo. | 750,000 | 15,000 | 50 | 45,000 | 270,000 | Oct., 1899, .75 |
| 26 | Boston-Little Circle, z | Mo-K. | 1,000,000 | 100,000 | 10 | 80,000 | 80,000 | Dec., 1899, .15 |
| 27 | Boston & Mont. Con | Mont. | 3,750,000 | 150,000 | 25 | 5,375,000 | 14,500,000 | Nov., 1899, 15.00 |
| 28 | Boston, q | Cal | 1,000,000 | 100,000 | 10 | 10,000 | 10,000 | Oct., 1899, .10 |
| 29 | Breece, l | Colo. | 5,000,000 | 200,000 | 25 | 40,000 | 70,000 | Dec., 1899, .05 |
| 30 | Bullion-Beck & Champ | Utah. | 1,000,000 | 100,000 | 10 | 120,000 | 2,438,400 | Dec., 1899, .10 |
| 31 | Bunker Hill & Sullivan | Idaho | 3,000,000 | 300,000 | 10 | 168,000 | 768,000 | Dec., 1899, .07 |
| 32 | Calumet & Hecla, c | Mich. | 2,500,000 | 100,000 | 25 | 8,000,000 | 64,850,000 | Sept., 1899, 20.00 |
| 33 | Cariboo-McKinney, g | B.Col | 800,000 | 800,000 | 1 | 72,000 | 311,965 | June, 1899, .01½ |
| 34 | Centen'l-Eureka, g.s.l.c, | Utah. | 5,000,000 | 200,000 | 25 | 120,000 | 2,150,000 | Aug., 1899, .50 |
| 35 | Central Lead, l | Mo | 1,000,000 | 10,000 | 100 | 60,000 | 142,000 | Dec., 1899, .50 |
| 36 | Champion, g. s | Cal | 340,000 | 34,000 | 10 | 25,500 | 321,700 | Nov., 1899, .25 |
| 37 | Charleston, p. r | S. C. | 1,000,000 | 10,000 | 100 | 20,000 | 200,000 | June, 1899, 2.00 |
| 38 | Colorado Smelting | Colo. | 1,000,000 | 100,000 | 10 | 100,000 | 1,945,000 | Jan., 1899, 1.00 |
| 39 | Commodore | Co o. | 1,200,000 | 1,200,000 | 1 | 48,000 | 432,000 | Jan., 1899, .04 |
| 40 | Commonwealth, z., pref. | Mo | 500,000 | 100,000 | 5 | 20,000 | 20,000 | Dec., 1899, .01 |
| 41 | Consolidation Coal | Md | 10,250,000 | 102,500 | 100 | 205,000 | 5,716,650 | Feb., 1899, 2.00 |
| 42 | Con. Tiger & Poorman | Idaho | 1,000,000 | 1,000,000 | 1 | ..... | 20,000 | Dec., 1898, .02 |
| 43 | Crœsus, g | Cal | 1,000,000 | 200,000 | 5 | ..... | 30,000 | Dec., 1898, .15 |
| 44 | Crowned King, g. s. l | Ariz. | 6,000,000 | 600,000 | 10 | ..... | 232,000 | Dec., 1898, .02 |
| 45 | Daly | Utah. | 3,000,000 | 150,000 | 20 | ..... | 2,925,000 | Mar., 1897, .25 |
| 46 | Daly West | Utah. | 3,000,000 | 150,000 | 20 | 60,000 | 60,000 | Nov., 1899, .20 |
| 47 | Deadwood-Terra, g | S. D. | 5,000,000 | 200,000 | 25 | ..... | 1,350,000 | May., 1898, .15 |
| 48 | Deer Trail No. 2 | Wash | 1,000,000 | 1,000,000 | 1 | 27,500 | 45,000 | Nov., 1899, .00¼ |
| 49 | De Lamar, g. s | Idaho | 2,000,000 | 400,000 | 5 | 48,000 | 2,346,000 | May., 1899, .12 |
| 50 | Della S., g | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 60,000 | Jan., 1897, .01 |
| 51 | Delta Lead & Zinc | Mo | 100,000 | 100,000 | 1 | 4,100 | 4,100 | Dec., 1899, .00¼ |
| 52 | Doe Run, l | Mo | 500,000 | 5,000 | 100 | 30,000 | 90,000 | Dec., 1899, .50 |
| 53 | Dutch, g | Cal | 1,500,000 | 150,000 | 10 | ..... | 39,000 | Feb., 1898, .04½ |
| 54 | Eldorado, g | Cal | 1,000,000 | 100,000 | 10 | 10,000 | 10,000 | July., 1899, .10 |
| 55 | Elkton Cons., g | Colo. | 1,250,000 | 1,250,000 | 1 | 37,500 | 694,461 | Sept., 1899, .03 |
| 56 | El Paso, g. s | Colo. | 650,000 | 650,000 | 1 | ..... | 12,393 | Jan., 1898, .01 |
| 57 | Empire State-Idaho | Idaho | 1,000,000 | 100,000 | 10 | 256,135 | 323,037 | Dec., 1899, .30 |
| 58 | Enterprise, s. l | Colo. | 500,000 | 500,000 | 1 | ..... | 900,000 | Sept., 1898, .05 |
| 59 | Fanny Rawlings, g. s | Colo. | 1,000,000 | 1,000,000 | 1 | 20,000 | 20,000 | Aug., 1899, .01 |
| 60 | Fern, g | B.Col | 200,000 | 200,000 | 1 | ..... | 10,000 | Jan., 1898, .05 |
| 61 | Ferris-Haggarty, c.g.s | Wyo. | 1,000,000 | 1,000,000 | 1 | 5,000 | 5,000 | Mar., 1899, .00½ |
| 62 | Florence, s | Mont. | 2,500,000 | 500,000 | 5 | ..... | 137,530 | Aug., 1897, .01 |
| 63 | Garfield Con., g | Colo. | 1,200,000 | 1,200,000 | 1 | 12,000 | 12,000 | May., 1899, .01 |
| 64 | Geyser-Marion, g | Utah. | 1,500,000 | 300,000 | 5 | ..... | 96,000 | Sept., 1898, .02 |
| 65 | Gold Coin of Victor, g | Colo. | 1,000,000 | 1,000,000 | 1 | 110,000 | 260,000 | Nov., 1899, .01 |
| 66 | Gold & Globe, g | Colo | 750,000 | 750,000 | 1 | ..... | 51,625 | July., 1898, .00½ |
| 67 | Gold King, g | Colo. | 1,000,000 | 1,000,000 | 1 | 90,000 | 90,000 | Oct., 1899, .03 |
| 68 | Golden Cycle, g | Colo. | 1,000,000 | 200,000 | 5 | 105,000 | 258,500 | Dec., 1899, .05 |
| 69 | Golden Eagle, g | Colo. | 500,000 | 500,000 | 1 | 10,000 | 20,000 | Nov., 1899, .01 |
| 70 | Golden Fleece, g. s | Colo. | 600,000 | 600,000 | 1 | ..... | 569,480 | Feb., 1897, .01 |
| 71 | Golden Reward, g | S. D. | 1,000,000 | 100,000 | 10 | ..... | 155,000 | Feb., 1898, .15 |
| 72 | Golden Star, g | B.Col | 1,000,000 | 1,000,000 | 1 | 41,000 | 41,000 | July., 1899, .01 |
| 73 | Grafton, g | Colo. | 1,000,000 | 1,000,000 | 1 | 10,000 | 10,000 | Nov., 1899, .01 |
| 74 | Grand Central, g | Utah. | 250,000 | 250,000 | 1 | 347,500 | 666,250 | Sept., 1899, .24 |
| 75 | Grass Valley Expl | Cal | 100,000 | 30,000 | 2 | 30,000 | 30,000 | Oct., 1899, .25 |
| 76 | Gwin, g | Cal. | 1,000,000 | 20,000 | 50 | 50,000 | 101,500 | Dec., 1899, .25 |
| 77 | Hall Mines, Ltd | B.Col | 1,500,000 | 300,000 | 5 | ..... | 160,000 | May., 1898, .25 |
| 78 | Helena—Frisco, l. s | Idaho | 1,100,000 | 222,000 | 5 | 165,000 | 920,000 | Nov., 1899, .25 |
| 79 | Holy Terror, g | S. D. | 500,000 | 500 600 | 1 | 45,000 | 162,000 | Nov., 1899, .01 |
| 80 | Homestake, g | S. D. | 21,000,000 | 210,000 | 100 | 857,500 | 8,038,750 | Nov., 1899, .50 |
| 81 | Horn-Silver, g. s. c. sp. l | Utah. | 10,000,000 | 400,000 | 25 | 20,000 | 5,250,000 | Mar., 1899, .05 |
| 82 | Idaho, s. l | B.Col | $500,000 | 500,000 | $1 | $28,000 | $292,000 | Jan., 1899, .05¾ |
| 83 | Iowa, g | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 95,000 | June, 1898, .00½ |
| 84 | Iron Mountain, g. s. l. i | Mont. | 5,000,000 | 500,000 | 10 | ..... | 507,500 | April, 1898, .02 |
| 85 | Isabella, g | Colo. | 2,250,000 | 2,250,000 | 1 | 202,500 | 472,500 | Sept., 1899, .01 |
| 86 | Jack Pot, g | Colo. | 1,250,000 | 1,250,000 | 1 | 75,000 | 75,000 | Sept., 1899, .04 |
| 87 | Jamison | Cal | 3,900,000 | 390,000 | 10 | 11,700 | 50,700 | April, 1899, .10 |
| 88 | Klondike Bonanza, Ltd. | Klond | 750,000 | 52,750 | 5 | 12,000 | 12,000 | Aug., 1899, .24 |
| 89 | Lake Superior Iron | Mich. | 2,100,000 | 84,000 | 25 | 84,000 | 736,000 | Feb., 1899, 1.00 |
| 90 | Last Chance, s. l | B.Col | 500,000 | 500,000 | 1 | 25,000 | 45,000 | Apr., 1899, .05 |
| 91 | Last Dollar, g | Colo. | 1,500,000 | 1,500,000 | 1 | 20,000 | 20,000 | Oct., 1899, .02 |
| 92 | Le Roi, g | B.Col | 5,000,000 | 200,000 | 5 | 240,000 | 1,305,000 | Nov., 1899, 1.20 |
| 93 | Lillie, g | Colo. | 1,250,000 | 250,000 | 5 | 135,000 | 301,610 | Nov., 1899, .05 |
| 94 | Little Tiger, g | Cal | 500,000 | 500,000 | 1 | 25,000 | 25,000 | Nov., 1899, .01½ |
| 95 | Mammoth, g. s. c | Utah. | 10,000,000 | 400,000 | 25 | 260,000 | 1,610,000 | Nov., 1899, .10 |
| 96 | Marion Con | Colo. | 5,000,000 | 500,000 | 10 | 5,000 | 300,000 | May., 1899, .01 |
| 97 | Mary McKinney, g | Colo. | 1,000,000 | 1,000,000 | 1 | 30,000 | 30,000 | Oct., 1899, .03 |
| 98 | Matoa, g | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 25,000 | Dec., 1898, .02½ |
| 99 | Mead, g | Cal | 200,000 | 200,000 | 1 | 40,000 | 120,000 | June, 1899, .20 |
| 100 | Mercur, g | Utah. | 5,000,000 | 200,000 | 25 | 100,000 | 1,341,000 | Oct., 1899, 25 |
| 101 | Minnesota Iron | Minn. | 16,500,000 | 165,000 | 100 | ..... | 4,735,000 | Oct., 1898, 1.50 |
| 102 | Missouri Zinc Fields, pf | Mo | 400,000 | 16,000 | 25 | 18,648 | 18,648 | Nov., 1899, .17 |
| 103 | Modoc, g | Colo. | 500,000 | 500,000 | 1 | 30,000 | 130,000 | Nov., 1899, .01 |
| 104 | Montana, Ltd., g. s | Mont. | 3,300,000 | 657,128 | 5 | 98,855 | 453,700 | April, 1899, .12 |
| 105 | Montana Ore Purchas'g | Mont. | 2,500,000 | 80,000 | 25 | 560,000 | 1,360,000 | Oct., 1899, 1.00 |
| 106 | Monument, g | Colo. | 300,000 | 300,000 | 1 | ..... | 12,624 | Dec., 1898, .01 |
| 107 | Moon-Anchor Con., g | Colo. | 1,750,000 | 600,000 | 1 | 45,000 | 306,000 | Nov., 1899, .07½ |
| 108 | Morning Star, g | Cal | 240,000 | 2,400 | 100 | 63,200 | 751,890 | Oct., 1899, 3.00 |
| 109 | Mt. Rosa, g | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 60,000 | Jan., 1898, .02 |
| 110 | Mt. Shasta | Cal | 100,000 | 20,000 | 5 | 6,000 | 6,000 | May., 1899, .30 |
| 111 | Moulton | Mont. | 2,000,000 | 400,000 | 5 | 40,000 | 500,000 | Oct., 1899, .05 |
| 112 | Mountain Copper | Cal | 6,250,000 | 250,000 | 25 | 1,080,000 | 1,173,750 | Oct., 1899, 2.16 |
| 113 | Napa Cons., q | Cal | 700,000 | 100,000 | 7 | 90,000 | 1,040,000 | Oct., 1899, .30 |
| 114 | New Central Coal | Md | 1,00,000 | 50,000 | 20 | 20,000 | 470,000 | April, 1899, .40 |
| 115 | New Idria, q | Cal | 500,000 | 100,000 | 5 | 90,000 | 170,000 | Oct., 1899, .30 |
| 116 | New York Zinc | Mo | 700,000 | 28,000 | 25 | 21,000 | 21,000 | Dec., 1899, .25 |
| 117 | N. Y. & Hon Rosario, s. g | C. A. | 1,500,000 | 150,000 | 10 | 150,000 | 1,130,000 | Nov., 1899, .10 |
| 118 | North Star Mines of N. J. | Cal | 5,000,000 | 250,000 | 10 | 50,000 | 50,000 | Nov., 1899, .20 |
| 119 | Nugget | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 30,000 | Aug., 1899, .00¼ |
| 120 | Okanogan, g | Wash | 62,500 | 1,250,000 | 05 | 3,125 | 3,125 | Oct., 1899, .00¼ |
| 121 | Ontario, s. l | Utah. | 1,500,000 | 150,000 | 100 | ..... | 13,557,500 | Nov., 1897, .75 |
| 122 | Orphan Bell, g | Colo. | 1,000,000 | 1,000,000 | 1 | ..... | 115,000 | Mar., 1898, .01 |
| 123 | Original Empire, g | Cal | 5,000,000 | 50,000 | 100 | 100,000 | 500,000 | May., 1899, 1.00 |
| 124 | Osceola, c | Mich. | 2,500,000 | 93,000 | 25 | 558,000 | 3,080,500 | Dec., 1899, 3.00 |
| 125 | Parrot, c | Mont. | 2,300,000 | 230,000 | 10 | 897,000 | 3,035,898 | Oct., 1899, 1.50 |
| 126 | Pennsylvania Coal | Pa | 5,000,000 | 100,000 | 50 | 800,000 | 4,050,000 | May., 1899, 8.00 |
| 127 | Pennsylvania Cons | Cal | 5,150,000 | 51,500 | 100 | 68,250 | 136,475 | Dec., 1899, .20 |
| 128 | Petro, g | Utah. | 1,000,000 | 200,000 | 5 | 15,000 | 32,000 | Oct., 1899, .02½ |
| 129 | Pioneer, g | Cal | 1,000,000 | 100,000 | 10 | 12,500 | 62,500 | Mar., 1899, .12½ |
| 130 | Portland, g | Colo. | 3,000,000 | 3,000,000 | 1 | 600,000 | 2,437,080 | Nov., 1899, .02 |
| 131 | Queen Bess Propr., s. l | B.Col | 500,000 | 100,000 | 5 | 25,000 | 25,000 | July., 1899, .12½ |
| 132 | Quicksilver, pref | Cal | 4,300,000 | 43,000 | 100 | 21,500 | 1,845,411 | May., 1899, .50 |
| 133 | Quincy, c | Mich. | 2,500,000 | 100,000 | 25 | 950,000 | 11,070,000 | Aug., 1899, 6.00 |
| 134 | Rambler—Cariboo, s. l | B.Col | 1,000,000 | 1,000,000 | 1 | 20,000 | 60,000 | Dec., 1899, .01 |
| 135 | Raven, g | Colo. | 1,500,000 | 1,500,000 | 1 | 30,000 | 49,500 | Nov., 1899, .01 |
| 136 | Reco, s. l | B.Col | 1,000,000 | 1,000,000 | 1 | ..... | 297,500 | Jan., 1898, .10 |
| 137 | Republic Cons., g | Wash | 3,500,000 | 3,150,000 | 1 | 157,500 | 277,500 | Sept., 1899, .01 |
| 138 | Royal Con | B.Col | 2,500,000 | 2,500,000 | 1 | 50,000 | 1,050,000 | June, 1899, .01 |
| 139 | Sacramento, g | Utah. | 5,000,000 | 1,000,000 | 5 | 50,000 | 138,000 | Oct., 1899, .00½ |
| 140 | St. Joseph, l | Mo | 3,000,000 | 300,000 | 10 | 112,500 | 2,897,000 | Sept., 1899, .50 |
| 141 | Seventy-Six, g. s | Colo. | 1,000,000 | 200,000 | 5 | ..... | 2,950 | Mar., 1898, .02 |
| 142 | Santa Rosalia, g. s | Cal | 100,000 | 100,000 | 1 | 5,000 | 130,000 | Oct., 1899, .05 |
| 143 | Silver King, g. s. l | Utah. | 3,000,000 | 150,000 | 20 | 575,000 | 2,400,000 | Dec., 1899, .34 |
| 144 | Small Hopes, s | Colo. | 5,000,000 | 250,000 | 20 | 25,000 | 3,325,000 | Feb., 1899, .10 |
| 145 | Smuggler, s. l. z | Colo. | 1,000,000 | 1,000,000 | 1 | 125,000 | 1,220,000 | Dec., 1899, .01 |
| 146 | South Swansea, s. l | Utah. | 150,000 | 150,000 | 1 | 52,500 | 165,000 | Dec., 1899, .05 |
| 147 | Squaw Mountain, g | Colo. | 2,000,000 | 2,000,000 | 1 | 10,000 | 10,000 | Nov., 1899, .00½ |
| 148 | Standard Cons., g. s | Cal | 2,000,000 | 200,000 | 10 | 60,000 | 3,893,226 | Nov., 1899, .10 |
| 149 | Standard | Idaho | 500,000 | 500,000 | 1 | 30,000 | 1,745,000 | April, 1899, .06 |
| 150 | Stratton's Independ'ce | Colo. | 5,500,000 | 1,100,000 | 5 | 488,000 | 488,000 | Sept., 1899, .48 |
| 151 | Swansea, s. l | Utah. | 500,000 | 100,000 | 5 | 60,000 | 251,000 | Nov., 1899, .05 |
| 152 | Tamarack, c | Mich. | 1,500,000 | 60,000 | 25 | 600,000 | 6,270,000 | Dec., 1899, 6.00 |
| 153 | Tomboy, g | Colo. | 1,500,000 | 300,000 | 5 | 152,000 | 812,000 | Dec., 1899, .24 |
| 154 | United, z. l., pref | Mo | 1,000,000 | 40,000 | 25 | 40,000 | 40,000 | July., 1899, .50 |
| 155 | Utah | Utah. | 1,000,000 | 100,000 | 10 | 2,000 | 179,000 | Jan., 1899, .02 |
| 156 | Victor, g | Colo. | 1,000,000 | 200,000 | 5 | ..... | 1,155,000 | Dec., 1898, .50 |
| 157 | Vindicator, Cons., g | Colo. | 1,500,000 | 1,015,000 | 1 | 177,625 | 304,500 | Oct., 1899, .05 |
| 158 | War Eagle, Cons | B.C. | 2,000,000 | 1,750,000 | 1 | 315,000 | 492,750 | Dec., 1899, .01½ |
| 159 | West. Mine Enterprise | Mont. | 500,000 | 120,000 | 1 | ..... | 48,680 | Jan., 1898, .20 |
| 160 | Wolverine, c | Mich. | 1,500,000 | 60,000 | 25 | 210,000 | 270,000 | Oct., 1899, 1.50 |
| 161 | Yellow Aster, g | Cal | 1,000,000 | 100,000 | 10 | 115,000 | 283,789 | Dec., 1899, .10 |

## NON-DIVIDEND-PAYING MINES.

| | Name and Location of Company. | | Capital Stock. | Shares. No. | Shares. Par Val | Assessments. Levied 1899. | Assessments. Total to Date. | Assessments. Date and Amount of Last. |
|---|---|---|---|---|---|---|---|---|
| 1 | Alaska | Utah. | $1,000,000 | 1,000,000 | $1 | $50,000 | $50,000 | Sept., 1899, .01½ |
| 2 | Arnold, c | Mich. | 1,500,000 | 60,000 | 25 | 180,000 | 180,000 | Jan., 1899, 3.00 |
| 3 | Best & Belcher, g. s | Nev. | 302,400 | 100,800 | 3 | 40,320 | 2,631,403 | Oct., 1899, .30 |
| 4 | Bingham Placer | Utah. | 275,000 | 275,000 | 1 | 27,500 | 27,500 | Oct., 1899, .10 |
| 5 | Boston & Cp. Ck., g | Colo. | 400,000 | 200,000 | 2 | ..... | 20,000 | Aug., 1898, .10 |
| 6 | California Borax | Cal. | 200,000 | 2,000 | 100 | 4,000 | 4,000 | Oct., 1899, 2.00 |
| 7 | Centennial, c | Mich. | 2,500,000 | 100,000 | 25 | ..... | 460,000 | Mar., 1898, 3.00 |
| 8 | Central Eureka, g | Cal. | 4,000,000 | 400,000 | 10 | 34,000 | 135,942 | Sept., 1899, .03 |
| 9 | Chollar, g. s | Nev. | 336,000 | 112,000 | 3 | 28,000 | 2,975,000 | Aug., 1899, .15 |
| 10 | Con. Cal. & Va | Nev. | 540,000 | 216,000 | 2½ | 108,000 | 786,000 | Oct., 1899, .25 |
| 11 | Cons. Imperial, g. s | Nev. | 500,000 | 500,000 | 1 | 10,000 | 2,256,000 | Nov., 1899, .01 |
| 12 | Crown Point, g. s | Nev. | 300,000 | 100,000 | 3 | 20,000 | 2,990,000 | Nov., 1899, .10 |
| 13 | Dalton, s. l | Utah. | 2,500,000 | 500,000 | 5 | 5,000 | 58,750 | April, 1899, .01 |
| 14 | Dexter | Nev. | 1,000,000 | 200,000 | 5 | ..... | 38,000 | Apr., 1898, .15 |
| 15 | Diamond Con | Utah. | 1,000,000 | 200,000 | 5 | 8,000 | 8,000 | Mar., 1899, .04 |
| 16 | Eureka Con. Drift, g | Cal. | 500,000 | 500,000 | 1 | 12,500 | 183,000 | Nov., 1899, .00½ |
| 17 | Geyser, s. l | Colo. | 5,000,000 | 500,000 | 10 | 150,000 | 1,225,000 | July., 1899, .10 |
| 18 | Gold Coin | Colo. | 1,000,000 | 200,000 | 5 | 10,000 | 10,000 | Mar., 1899, .05 |
| 19 | Gould & Curry | Nev. | 324,000 | 108,000 | 5 | 27,000 | 4,646,050 | Oct., 1899, .15 |
| 20 | Granite Hill, g. s | Cal. | 500,000 | 100,000 | 5 | 3,000 | 124,000 | June, 1899, .03 |
| 21 | Great Western, q | Cal. | 5,000,000 | 50,000 | 100 | 20,000 | 75,520 | May., 1899, .15 |
| 22 | Hale & Norcross, g. s | Nev. | 336,000 | 112,000 | 3 | 39,200 | 39,200 | Nov., 1899, .10 |
| 23 | Head Center Con., s. g | Ariz. | 5,000,000 | 200,000 | 25 | 25,125 | 25,125 | Mar., 1899, .20 |
| 24 | Horse Shoe Bar Cons | Cal. | 6,000,000 | 60,000 | 100 | 3,000 | 85,800 | Jan., 1899, .05 |
| 25 | Little Pittsburg | Utah. | 2,000,000 | 400,000 | 5 | 3,000 | 21,000 | June, 1899, .00¾ |
| 26 | Lower Mammoth | Utah. | 150,000 | 150,000 | 1 | 7,500 | 22,500 | June, 1899, .05 |
| 27 | Lucky Bill | Utah. | 300,000 | 120,000 | 2½ | 2,500 | 58,800 | Nov., 1899, .02 |
| 28 | Marguerite, g | Cal. | 500,000 | 50,000 | 10 | 15,000 | 85,000 | Aug., 1899, .10 |
| 29 | Marina Marsicano, g | Cal. | $1,000,000 | 100,000 | $10 | $19,000 | $54,360 | Oct., 1899, .05 |
| 30 | Martin White | Nev. | 1,000,000 | 100,000 | 10 | 150,000 | 150,000 | Dec., 1899, 1.50 |
| 31 | Mayday, g. s | Cal | 50,000 | 50,000 | 1 | 5,000 | 10,000 | July., 1899, .10 |
| 32 | Mayflower, g | Cal. | 1,200,000 | 60,000 | 20 | ..... | 6,000 | Sept., 1898, .05 |
| 33 | Meteor, s. l | Utah. | 600,000 | 300,000 | 2 | 6,000 | 9,734 | Sept., 1899, .01 |
| 34 | Mexican, g. s | Nev. | 302,400 | 100,800 | 3 | 25,200 | 2,283,920 | Nov., 1899, .15 |
| 35 | Montreal | Utah. | 2,500,000 | 250,000 | 10 | 25,000 | 30,625 | April, 1899, .05 |
| 36 | Northern Light, g | Utah. | 2,000,000 | 400,000 | 5 | ..... | 80,000 | July., 1898, .10 |
| 37 | Ophir, g. s | Nev. | 302,400 | 100,800 | 3 | 50,400 | 4,652,968 | Nov., 1899, .20 |
| 38 | Osceola, g | Cal | 10,000,000 | 100,000 | 100 | 1,000 | 11,810 | Oct., 1899, .01 |
| 39 | Potosi, g. s | Nev. | 336,000 | 112,000 | 3 | 28,000 | 2,185,200 | Sept., 1899, .15 |
| 40 | Powning | Cal. | 750,000 | 75,000 | 10 | 2,800 | 2,800 | Aug., 1899, .01 |
| 41 | Rescue, g | Nev. | 100,000 | 10,000 | 10 | 500 | 5,500 | Feb., 1899, .05 |
| 42 | Reward, g | Cal. | 64,000 | 64,000 | 1 | 1,400 | 65,280 | Nov., 1899, .02½ |
| 43 | Revenue | Utah. | 150,000 | 150,000 | 1 | 4,500 | 4,500 | Nov., 1899, .02 |
| 44 | Salmon River, c. s. g | Nev. | 57,000 | 57,000 | 1 | 1,425 | 11,970 | Oct., 1899, .02½ |
| 45 | Savage, g. s | Nev. | 280,000 | 112,000 | 2½ | 22,400 | 7,309,800 | Sept., 1899, .10 |
| 46 | Shower Con | Utah. | 2,000,000 | 400,000 | 5 | 8,000 | 8,000 | Aug., 1899, .02 |
| 47 | Sierra-Nevada, g. s | Nev. | 300,000 | 100,000 | 3 | 50,000 | 6,756,910 | Dec., 1899, .15 |
| 48 | Silver King, s | Ariz. | 10,000,000 | 100,000 | 100 | 50,000 | 490,000 | Aug., 1899, .25 |
| 49 | Snow Flake | Utah. | 500,000 | 100,000 | 5 | 5,000 | 51,000 | July., 1899, .02 |
| 50 | Sunbeam Cons | Utah. | 250,000 | 250,000 | 1 | 50,000 | 73,125 | Oct., 1899, .10 |
| 51 | Tetro | Utah. | 300,000 | 300,000 | 1 | 15,000 | 33,000 | Nov., 1899, .01 |
| 52 | Union Cons., g. s | Nev. | 250,000 | 100,000 | 2½ | 18,000 | 2,660,000 | Sept., 1899, .15 |
| 53 | Utah Cons, s | Nev. | 100,000 | 100,000 | 1 | 15,000 | 485,000 | Sept., 1899, .05 |
| 54 | Valeo | Utah. | 200,000 | 200,000 | 1 | 10,000 | 10,000 | May., 1899, .05 |
| 55 | Watt Blue Gravel, g | Cal. | 1,100,000 | 100,000 | 10 | 3,000 | 58,000 | May., 1899, .03 |
| 56 | Yellow Jacket, g. s | Nev. | 360,000 | 120,000 | 3 | 18,000 | 5,306,000 | April, 1899, .15 |

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. This table is corrected up to Dec. 1. Correspondents are requested to forward changes or additions.

## CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

| | Cust. Meas. | Price. |
|---|---|---|
| **Abrasives—** | | |
| Carborundum, f.o.b. Niagara Falls grains.. | lb. | $0.10 |
| Powd., F. FF. FFF.. | " | .08 |
| Minute No. 1..... | " | .15 |
| No. 15..... | " | 1.00 |
| Corundum, N. C..... | " | .07@.10 |
| Chester..... | " | .04½@.05 |
| Emery, Turkish flour... | " | .03 |
| Grains..... | " | .05 |
| Naxos flour..... | " | .03 |
| Grains..... | " | .05 |
| Chester flour..... | " | .03 |
| Grains..... | " | .05 |
| Peekskill flour..... | " | .01¾ |
| Grains..... | " | .02½ |
| Crude, Kuluk, best...lg. ton | | 18.50 |
| Levant, " | " | 22.00 |
| Naxos (Greek) best | " | 26.00 |
| Pumice Stone, Am. powd. | lb. | .01½@.02 |
| Italian, powdered.... | " | .01¼ |
| Lump, per quality.. | " | .04@.40 |
| Rottenstone, ground.... | " | .02½@.03 |
| Lump, per quality.... | " | .05@.14 |
| Rouge..... | " | .17@.30 |
| Tripoli, prepared.....sh. ton | | 20.00 |
| **Acids**—Acetic, 30% pure..100 lbs. | | 2.75@4.00 |
| 30% ch. pure..... | " | 6.00@8.00 |
| 80% pure..... | " | 7.50@9.50 |
| Benzoic, English..... | oz. | .09@.09½ |
| German..... | lb. | .46@.47 |
| Boracic, pure cryst.... | " | .11 |
| Powdered..... | " | .11½@.11¾ |
| Carbolic, cryst. in drums | " | .16 |
| Carbonic, liquid..... | " | .15 |
| Chromic, crude..... | " | .23 |
| Chem. pure..... | " | .50 |
| Absol. ch. pure..... | " | 1.75 |
| Hydrochloric, ch. pure. | " | .08 |
| Hydrofluoric, 36%..... | " | .03@.04½ |
| 48%..... | " | .05@.06 |
| Best..... | " | .25 |
| Nitric, chem. pure..... | " | .10 |
| Sulphuric, 98%..... | " | .02 |
| Chem. pure..... | " | .07 |
| Tartaric, cryst..... | " | .32 |
| Powder..... | " | .32½ |
| **Alcohol**—Grain..... | gal. | 2.42@2.44 |
| Refined wood, 95@97% | " | .80@.85 |
| Purified..... | " | 1.20@1.55 |
| **Alum**—Lump.....100 lbs. | | 1.75 |
| Ground..... | " | 1.85 |
| Chrome, com'l..... | " | 3.50 |
| **Aluminum—** | | |
| Nitrate..... | lb. | 1.50 |
| Oxide, com'l, common.. | " | .06½ |
| Best..... | " | .20 |
| Pure..... | " | .80 |
| Hydrated..... | " | .05 |
| Sulphate, pure..... | " | .02 |
| Com'l..... | " | 1.50 |
| **Ammonia**—Aqua, 16°.. | " | .04 |
| 18°..... | " | .04½@.05½ |
| 20°..... | " | .05@.06 |
| 26°..... | " | .07@.08 |
| **Ammonium**—Bromide, p'r | " | .52@.53 |
| Carbonate lumps..... | " | .08¼@.08¾ |
| Powdered..... | " | .09¼@.09¾ |
| Muriate, gran., white... | " | .06¾ |
| Gran. ch. p..... | " | .09¼ |
| Lump..... | " | .09¼ |
| Gray..... | " | .06¼ |
| Nitrate, white, pure (99%) | " | .10½ |
| Phosphate, com'l..... | " | .12@.15 |
| Chem. pure.. | " | .60 |
| **Antimony**—Glass ..... | " | .30@.40 |
| Needle, lump..... | " | .05½@.06 |
| Powdered, ordinary.. | " | .05¾ |
| Best..... | " | .08½ |
| Oxide, com'l white, 95%. | " | .09¼ |
| Com'l white, 99%..... | " | .10½ |
| Com'l gray..... | " | .07@.08 |
| Sulphuret, com'l..... | " | .16 |
| **Arsenic**—White ..... | " | .04¾@.05¼ |
| Red ..... | " | .07¾@.08½ |
| **Asphaltum—** | | |
| Ventura, Cal.....sh ton | | 32.00 |
| Cuban, refined..... | lb. | .04½ |
| Common..... | " | .02 |
| Egyptian, refined..... | " | .06½ |
| Trinidad, refined..... | " | .01½ |
| San Valentino .....lg. ton | | 15.00 |
| Gilsonite, Utah, ordinary | lb. | .03¼ |
| Select..... | " | .03¾ |
| **Barium**—Carbonate, Lump, 80@90% ....sh. ton | | 25.00@27.50 |
| 92@98%..... | " | 26.00@29.00 |
| Powdered, 80@90%... | lb. | .01¾@.02 |
| Chloride, com'l..... | " | .02¼ |
| Chem. pure cryst .... | " | .05 |
| Nitrate, powdered ..... | " | .05¾ |
| Oxide, com'l, hyd.cryst | " | .18@.22 |
| Hydrated, pure cryst. | " | .25 |
| Pure, powd..... | " | .27 |
| Sulphate..... | " | .01 |
| **Barytes**—Crude, No. 1..sh. ton | | 9.00@10.00 |
| No. 2..... | " | 8.00@8.25 |
| No. 3..... | " | 7.75@8.00 |
| Prime White..... | " | 18.00@20.00 |
| Floated..... | " | 19.00@20.00 |
| **Bauxite**—Ga.&Ala, f.o.b. cars, first grade.....lg. ton | | 5.00 |
| Second grade..... | " | 3.75 |
| **Benzole**—90%..... | gal. | 1.00@1.10 |
| **Bismuth**—Oxide, hydr.. | lb | 2.25@2.56 |
| Subnitrate cryst..... | oz. | .09@.10 |
| **Bitumen**, "B"..... | lb. | .03½ |
| "A"..... | " | .05 |
| **Bone Ash**..... | " | 02¾@.03½ |
| **Borax**—Cryst. and pow'd | " | .07@.07¼ |
| Calcined ..... | " | .22 |
| **Bromine**—Bulk..... | " | .45 |
| **Cadmium**—Metallic..... | " | 1.50@2.00 |
| Sulphide..... | " | 2.00@3.00 |
| Sulphate..... | " | 2.00@2.50 |
| Carbide, in ton lots, f. o. b. Niagara Falls, N.Y. | lb. | .03@.04 |

| | Cust. Meas. | Price. |
|---|---|---|
| **Calcium**— | | |
| Acetate, pure white.....100 lbs. | | $1.00 |
| Gray..... | " | 1.35@1.40 |
| Brown ..... | " | .90@.95 |
| Carbonate, ppt..... | lb. | .05 |
| Chloride, com'l.....100 lbs. | | .95 |
| Best ..... | " | 1.90 |
| Sulphite..... | lb. | .05 |
| **Cement—** | | |
| Portland, Am., 400 lbs.. | bbl. | 1.50@2.00 |
| Foreign..... | " | 1.75@2.50 |
| "Rosendale," 300 lbs... | " | .90 |
| Sand cement, 400 lbs... | " | 1.55@1.95 |
| Slag cement, imported. | " | 1.65 |
| **Ceresine—** | | |
| Orange and Yellow..... | lb. | .11 |
| White..... | " | .13 |
| **Chalk**—Lump, bulk.....sh. ton | | 2.15@2.25 |
| Precipitated..... | lb. | .04@.04½ |
| French..... .....100 lbs. | | .30@.35 |
| **Chlorine**—Liquid..... | lb. | .30 |
| Water..... | " | .15 |
| **Chrome Ore—** | | |
| (50% chrome) ex-ship....lg. ton | | 20.00@21.00 |
| Sand..... | " | 35.00 |
| **Clay, China**—Am. com., ex-dock, N. Y.....lg. ton | | 7.70 |
| Am. best, ex-dock, N. Y. | " | 8.70 |
| English, common..... | " | 11.00 |
| Best grade..... | " | 16.00 |
| Fire, ground, f.o.b. Jersey City, N. J..... ...sh. ton | | 4.00@5.00 |
| Slip Clay..... | " | 6.00 |
| **Cobalt**—Carbonate..... | lb. | 1.50 |
| Nitrate ..... | " | 1.30 |
| Oxide—Black..... | " | 2.00 |
| Gray..... | " | 2.50 |
| Smalt, blue ordinary | " | .20 |
| Best..... | " | .30 |
| Chem. pure..... | " | 5.00 |
| **Copperas**.....100 lbs. | | .62½ |
| **Copper—** | | |
| Carbonate..... | lb. | .18@.20 |
| Chloride..... | " | .25 |
| Nitrate, crystals..... | " | .35 |
| Oxide..... | " | .19@.20 |
| **Cream of Tartar**—crys. | " | .23½ |
| Granulated..... | " | .24 |
| Powdered ..... | " | .24 |
| **Cryolite**..... | " | .06½ |
| **Explosives—** | | |
| Blasting powder, A..... | " | .10 |
| Blasting powder, B..... | " | -05@.05½ |
| "Rackarock," A..... | " | .25 |
| "Rackarock," B..... | " | .18 |
| Judson R.R. powder.... | " | .10 |
| Dynamite, (40% nitroglycerine)..... | " | .15 |
| (50% nitro-glycerine).. | " | .17 |
| (60% nitro-glycerine).. | " | .19 |
| (75% nitro-glycerine).. | " | .23 |
| Glycerine for nitro (32 2-10° Be.)..... | " | .16½ |
| Nitro-Benzole..... | " | .14 |
| **Feldspar**—Ground.....sh. ton | | 6.50@7.75 |
| **Flint**—(See Silica). | | |
| **Fluorspar**, f. o. b. mines— | | |
| Am. lump, 1st grade... | " | 7.50 |
| 2d gr..... | " | 6.50 |
| Gravel..... | " | 6.00 |
| Crushed..... | " | 5.75 |
| Ground, ex. fine ..... | " | 19.00 |
| 2d gr..... | " | 15.00 |
| Foreign, lump..... | " | 8.00@12.00 |
| Ground..... | " | 11.50@14.00 |
| **Fuller's Earth**—Lump.100 lbs. | | .75 |
| Powdered..... | " | .85 |
| **Ganister Rock**.....lg. ton. | | 6.50 |
| **Graphite**—(See Plumbago). | | |
| **Gypsum—** | | |
| Am. gr'd (terra alba)...sh. ton | | 8.00 |
| Fertilizer..... | " | 7.00 |
| Rock..... | lg. ton | 4.00 |
| English and French..... | | 14.00@16.00 |
| **Infusorial Earth**—Ground. | | |
| American, best..... | " | 20.00 |
| French..... | " | 37.50 |
| German..... | " | 40.00 |
| **Iodine**—Crude.....100 lbs. | | 2.45 |
| Resublimed..... | " | 2.85 |
| **Iron**—Chromate..... | lb. | .03@.10 |
| Muriate ..... | " | .05 |
| Nitrate, com'l..... | " | .01¼@.01¾ |
| True..... | " | .04 |
| Oxide, pure copperas col | " | .05@.10 |
| Purple-brown..... | " | .02 |
| Veneian red..... | " | 01@.01½ |
| Scale ..... | " | .01@.03 |
| **Kaolin**—(See Clay, China). | | |
| **Kryolith**—(See Cryolite.) | | |
| **Lead**—Acetate, white ... | lb. | .06½@.07½ |
| Com'l, broken..... | " | .06@.07 |
| White, gran..... | " | .07½@.08 |
| Nitrate, com'l..... | " | .00½@.06¾ |
| Chem. pure..... | " | .35 |
| **Lime**—Bldg., ab. 250 lbs | bbl. | .90 |
| Finishing..... | " | 1.00 |
| **Magnesite—** | | |
| Crude, lump (95%) Greece | lg. ton | 7.25 |
| German (85%)..... | " | 12.00 |
| Calcined, 600° C. (Greece) | " | 15.00 |
| 1,000° C. (Greece) | " | 18.50 |
| 3,000° F. (Greece).. | " | 21.00 |
| Domestic, soft.....sh. ton | | 12.00@15.00 |
| Bricks, all magnesite.. | M. | 185 00 |
| Magnesite and chrome. | " | 226.00 |
| **Magnesium—** | | |
| Metallic, ingots (Ger).. | kg. | 5.95@6.90 |
| Powdered (Ger.)..... | " | 6.19 |
| Ribbon or wire (Ger.). | " | 10.00 |
| Carbonate, light, fine pd | lb. | .03¾@.04 |
| Blocks..... | " | .06@.09 |
| Chloride, com'l..... | " | 01¾ |
| Fused..... | " | .20 |
| Nitrate..... | " | 60 |
| **Manganese**—Crude, pow'd 70@75% binoxide.... | " | .02½@.03¼ |

| | Cust. Meas. | Price. |
|---|---|---|
| **Manganese**— | | |
| 75@85% binoxide.... | lb. | .01½@.02½ |
| 85@90% binoxide.... | " | .02½@.03¼ |
| 90@95% binoxide.... | " | .02¾@.05½ |
| Carbonate..... | " | .16@.20 |
| Chloride..... | " | .04 |
| Ore, 50%..... | unit | .22@.22½ |
| **Marble**—Flour .....sh. ton | | 5.50@8.00 |
| **Mercury—** | | |
| Bichloride ..... | lb. | .59@.60 |
| Bisulphate..... | " | .41 |
| **Mica**—N. Y. gr'nd, coarse | " | .05 |
| Fine..... | " | .08 |
| Sheets, 1½x3 in..... | " | .60 |
| 8x10 in..... | " | 13.00 |
| **Mineral Wool—** | | |
| Slag, ordinary.....100 lbs. | | .90 |
| Selected..... | " | 1.40 |
| Extra..... | " | 3.00 |
| Rock, ordinary.....sh. ton | | 32.00 |
| Selected.....100 lbs. | | 2.50 |
| Extra..... | " | 5.00 |
| **Monazite**—92%.....sh. ton | | 140.00 |
| **Nickel**—Oxide, bl'k No. 1 | lb. | 1.00 |
| Black No. 2..... | " | .60 |
| Green, No. 1..... | " | 1.00 |
| No. 2..... | " | .60 |
| **Oils—** | | |
| Black, reduced 29 gr.: | | |
| 25@30 cold test..... | gal. | .10½@.11 |
| 15, cold test..... | " | .11½@.12 |
| Zero..... | " | .12½@.13½ |
| Summer..... | " | .10@.10½ |
| Cylinder, dark steam ref | " | .09½@.14½ |
| Dark filtered..... | " | .12½@.17½ |
| Light filtered..... | " | .14½@.17 |
| Extra cold test..... | " | .23½@.26½ |
| Gasolene, 86° @ 90°..... | " | .16@.18 |
| Neutral filtered, lemon, 33@34 gr..... | " | .14½@.20 |
| White, 33@34 gr..... | " | .22½@.24½ |
| Wool grade, 32 gr.... | " | .12½@.15½ |
| Naphtha, 62°..... | " | .13¾ |
| Deodorized, 76°..... | " | .13¾ |
| Linseed, domestic raw.. | " | .44 |
| Boiled ..... | " | .46 |
| Calcutta, raw..... | " | .65 |
| Graphite, lubricating, Am. dry..... | lb. | .10 |
| In oil..... | " | .12 |
| Axle grease..... | " | .08½@.10 |
| Wood grease..... | " | .05@.06 |
| **Ozokerite**—Foreign .... | " | .08 |
| **Paints and Colors—** | | |
| Benzine, Sumatra..... | " | .35@.40 |
| Marbled..... | " | .27@.28 |
| Chrome green, common | " | .05@.06 |
| Extra..... | " | .12@.15 |
| Chem. pure..... | " | .19@.25 |
| Yellow, common..... | " | .10 |
| Best..... | " | .25 |
| Silica Graphite, thick.. | " | .12 |
| Thinned..... | gal. | 1.15 |
| Lampblack—Com'l..... | lb. | .03@.05 |
| Refined..... | " | .08@.10 |
| Calcined..... | " | .12@.20 |
| Fine spirit..... | " | .20@.35 |
| Litharge, Am. powd.. | " | .06@.06½ |
| English flake..... | " | .08@.08½ |
| Metallic, brown.....shr. ton | | 16.00@20.00 |
| Red..... | " | 16.00@20.00 |
| Ocher, Am. common.... | " | 9.25@10.00 |
| Best..... | " | 21.25@25.00 |
| Dutch, washed..... | lb. | .04¾@.05 |
| French, washed..... | " | .01¼@.02½ |
| Orange mineral, Am... | " | .07¾@.08 |
| Foreign, as to make.. | " | .09@.10½ |
| Paris green, pure..... | " | .11@.12 |
| Red lead, American..... | " | .06@.06½ |
| Foreign..... | " | .08@.08¼ |
| Shellac, "D. C."..... | " | .26 |
| Native..... | " | 16 |
| Turpentine, spirits..... | gal. | .44½@.45 |
| Ultramarine, best..... | lb. | .25 |
| Vermilion, Amer. lead.. | " | .10 |
| Quicksilver..... | " | .64@.65 |
| Chinese ..... | " | .80@.90 |
| English, imported.... | " | .67 |
| White lead, Am., dry... | " | .05½@.05¾ |
| In oil..... | " | .06@.06½ |
| English, in oil..... | " | .07½@.08¼ |
| Whiting, common.....100 lbs. | | .45 |
| Gilders..... | " | .50 |
| Zinc white, Am. ex. dry | lb. | .05¾@.06 |
| American, red seal.. | " | .07½@.08 |
| Green seal..... | " | .08@.08½ |
| Foreign, red seal, dry | " | .07¾@.08¾ |
| Green seal, dry..... | " | .08¾@.09¾ |
| Foreign, in oil..... | " | .10½@.11¾ |
| **Plumbago—** | | |
| Am. lump, f. o. b. Providence, R. I.....sh. ton | | 8.00 |
| Am. pulv., f. o. b. Providence, R. I..... | " | 30.00 |
| German, lump.....100 lbs. | | 1.50 |
| Pulverized..... | " | 2.00 |
| Ceylon, pulv. common. | lb | .04½ |
| Best..... | " | .06@.10 |
| Italian, pulv..... | " | .01¾ |
| **Potash**—Caustic, ord... | " | .05 |
| Elect. (90%)..... | " | .06@.07 |
| **Potassium—** | | |
| Metallic, in balls (Ger).. | kg. | 17.85 |
| Bicarbonate cryst..... | lb. | .08¼ |
| Powdered or gran.... | " | .12 |
| Bichromate..... | " | .09¾ |
| Bromide, ..... | " | .46@.47 |
| Carbonate..... | " | .03¾@.03¼ |
| Chromate..... | " | .35 |
| Cyanide (98@99%)..... | " | .28@.29 |
| Ferro-cyanide ..... | " | .19@.20 |
| Iodide ..... | " | 2.15 |
| Permanganate, pure cr. | " | .14@.15 |
| Prussiate, yellow..... | " | .19¼@.19½ |
| Red..... | " | .37@.38 |
| Silicate..... | " | .06 |
| Sulphide, com'l..... | " | .10 |

| | Cust. Meas. | Price. |
|---|---|---|
| **Quartz**—(See Silica). | | |
| **Rosin**—Common..... | bbl. | $1.25 |
| Best..... | " | 4.10 |
| **Salt**—N.Y. com. fine abt. 280 lbs..... | bbl. | .70 |
| N. Y. agricultural.....sh. ton | | 1.50 |
| N. Y. coarse..... | " | 2.30 |
| N. Y. dairy and table... | " | 2.90 |
| **Saltpeter**—Crude.....100 lbs. | | 3.50 |
| Refined..... | " | 4.25@5.50 |
| **Samarskite**..... | lb. | 1.00 |
| **Silica**—Best foreign....lg. ton | | 10.00@11.00 |
| Ground quartz, ord....sh. ton | | 6.00@8.00 |
| Best..... | " | 12.00 |
| Lump quartz..... | " | 2.50@4.00 |
| Fire bricks (Blue Welch) | M. | 35.00 |
| **Silver**—Chloride..... | oz. | .65 |
| Nitrate..... | " | .41 |
| Oxide..... | " | .85@1.10 |
| **Sodium**—Metallic..... | lb. | .07¾ |
| Acetate, com'l..... | " | .03¾@.04 |
| Bichromate..... | " | .07 |
| Bromide ..... | " | .49@.50 |
| Chlorate, com'l..... | " | .09¾@.10 |
| Hyposulphite.....100 lbs. | | 1.60@1.70 |
| Nitrite..... | lb. | .07½@.07¾ |
| Peroxide..... | " | .45 |
| Phosphate..... | " | .03 |
| Triphosphate ..... | " | .04 |
| Silicate, conc..... | " | .01@.01½ |
| Sulphate, gran., puri'd. | " | .03 |
| Sulphide.....100 lbs. | | 1.75 |
| Sulphite..... | lb. | .02½ |
| Tungstate, com'l. ..... | " | .35 |
| Pure..... | " | .50 |
| **Strontium**—Nitrate .... | " | .07½ |
| **Sulphur**—Roll.....100 lbs. | | 1.70 |
| Flour..... | " | 1.80@1.85 |
| Flowers, sublimed... | " | 2.00 |
| **Talc**—N. C. No. 1.....sh. ton | | 15.00@15.50 |
| No. 2..... | " | 10.00@12.00 |
| N. Y., Fibrous..... | " | 8.00@9.00 |
| French. .....100 lbs. | | 1.25@1.50 |
| Italian..... | " | 1.50@2.00 |
| **Tar**—Coal..... | bbl. | 3.00 |
| **Tin**—Chloride ..... | lb. | .13@.15 |
| Crystals..... | " | .24@.26 |
| Muriate, com'l. ..... | " | .09 |
| Oxide, white, ch. pure.. | " | .48@.50 |
| **Uranium**—Oxide..... | " | 1.80@3.00 |
| **Zinc**—Metallic, ch. pure.. | " | .09@.10 |
| Carbonate..... | " | .15 |
| Chloride ..... | " | .06@.08 |
| Dust..... | " | .07@.07¼ |
| Sulphate..... | " | .02½ |

## THE RARE ELEMENTS.

Prices given are at makers' works in Germany, unless otherwise noted.

| | Cust. Meas. | Price. |
|---|---|---|
| **Barium**—Amalgam ..... | grm. | $1.19 |
| Electrol..... | " | 5 71 |
| **Beryllium**—Powder..... | " | 5.95 |
| Crystals..... | " | 9.04 |
| Nitrate (N Y.)..... | oz. | 2.50 |
| **Boron**—Amorphous, pure | grm. | .19 |
| Crystals, pure..... | " | 1.43 |
| Nitrate (N. Y.)..... | lb. | 1.50 |
| **Calcium**—Electrol..... | " | 4.28 |
| **Cerium**—Fused.....grm. | | 2.02 |
| Nitrate (N. Y.)..... | lb. | 21.00 |
| **Chromium**—Fused ..... | kg. | 5.95 |
| Pure powder 95%..... | " | 1.79 |
| Chem. pure cryst..... | grm. | .21 |
| **Cobalt**—(98@99%)..... | kg. | 5.35@5.71 |
| Pure..... | " | 30.94 |
| **Didymium**—Powder..... | grm. | 3.81 |
| Nitrate (N. Y.)..... | oz. | 4.00 |
| **Erbium** ..... | grm. | 3.09 |
| Nitrate (N. Y.)..... | oz. | 3.00 |
| **Gallium**..... | grain | 9.52 |
| **Germanium**—Powder.... | grm. | 33.32 |
| Fused..... | " | 35.70 |
| **Glucinum**—Powder..... | " | 5.95 |
| Crystals..... | " | 9.04 |
| Nitrate (N. Y.)..... | oz. | 2.50 |
| **Indium**..... | grm. | 4.05 |
| **Iridium**—..... | kg. | 2.38 |
| **Lanthanum**—Powder.... | " | 4.28 |
| Electrol, in balls ..... | " | 9.04 |
| Nitrate (N. Y.)..... | oz. | 3.50 |
| **Lithium**..... | grm. | 2.38 |
| Nitrate (N. Y.)..... | oz. | .60 |
| **Molybdenum**—Powder... | kg. | 2.62 |
| Fused, electrol 95%.....100 grms. | | 15.47 |
| **Niobium**..... | grm. | 3.81 |
| **Osmium**..... | " | .95 |
| **Palladium**..... | " | .95 |
| **Rhodium**..... | " | 2.87 |
| **Rubidium**—Pure..... | " | 4.76 |
| **Ruthenium**—Pure powd | " | 2.38 |
| **Selenium**—Com'l powder | kg | 30.94 |
| Sublimed powder..... | " | 40.46 |
| Sticks..... | " | 38.32 |
| **Silicium**—Amorphous...100 grms. | | 2.87 |
| Crystals, pure.... ..... | " | 5.95 |
| **Strontium**—Electrol .... | grm. | 6.19 |
| **Tantalium**—Pure..... | " | 3.57 |
| **Tellurium**—Ch. p.sticks.100 grms. | | 11.90 |
| Powder..... | " | 9.52 |
| **Thallium** ..... | kg. | 23.80 |
| **Thorium**—Metallic.....grm. | | 7.85 |
| Nitrate 49@50% (N. Y.).. | lb. | 5.00@5.50 |
| **Titanium**..... | grm. | .71 |
| **Uranium**..... | " | .48 |
| Nitrate (N. Y.)..... | oz. | .25 |
| **Vanadium**—Fused..... | grm. | 1.19 |
| **Wolfram**—Fused.....100 grms. | | 22.80 |
| Powder, 95@98%..... | kg. | 1.90 |
| Chem. pure..... | " | 6.42 |
| **Yttrium**..... | grm. | 3.33 |
| Nitrate (N. Y.)..... | oz. | 4.00 |
| **Zirconium**—Com'l..... | kg. | 119.00 |
| Pure..... ..... | grm. | .71 |
| Nitrate (N. Y.)..... | oz. | 1.00 |

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to Oct. 20th. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Review of Chemicals and Minerals.